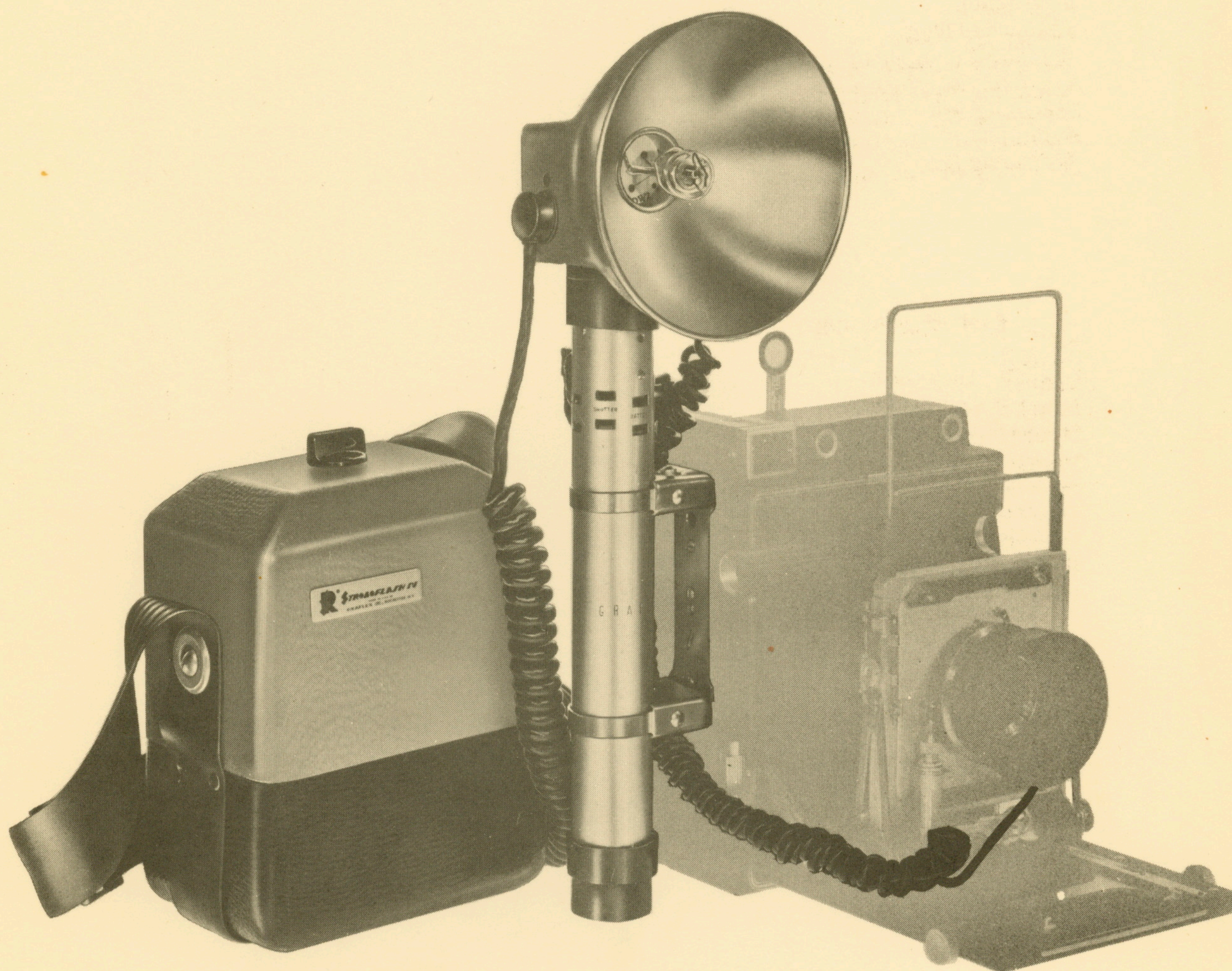




STROBOFLASH

SERVICE INSTRUCTIONS
and
PARTS CATALOG



GRAFLEX

**GENERAL
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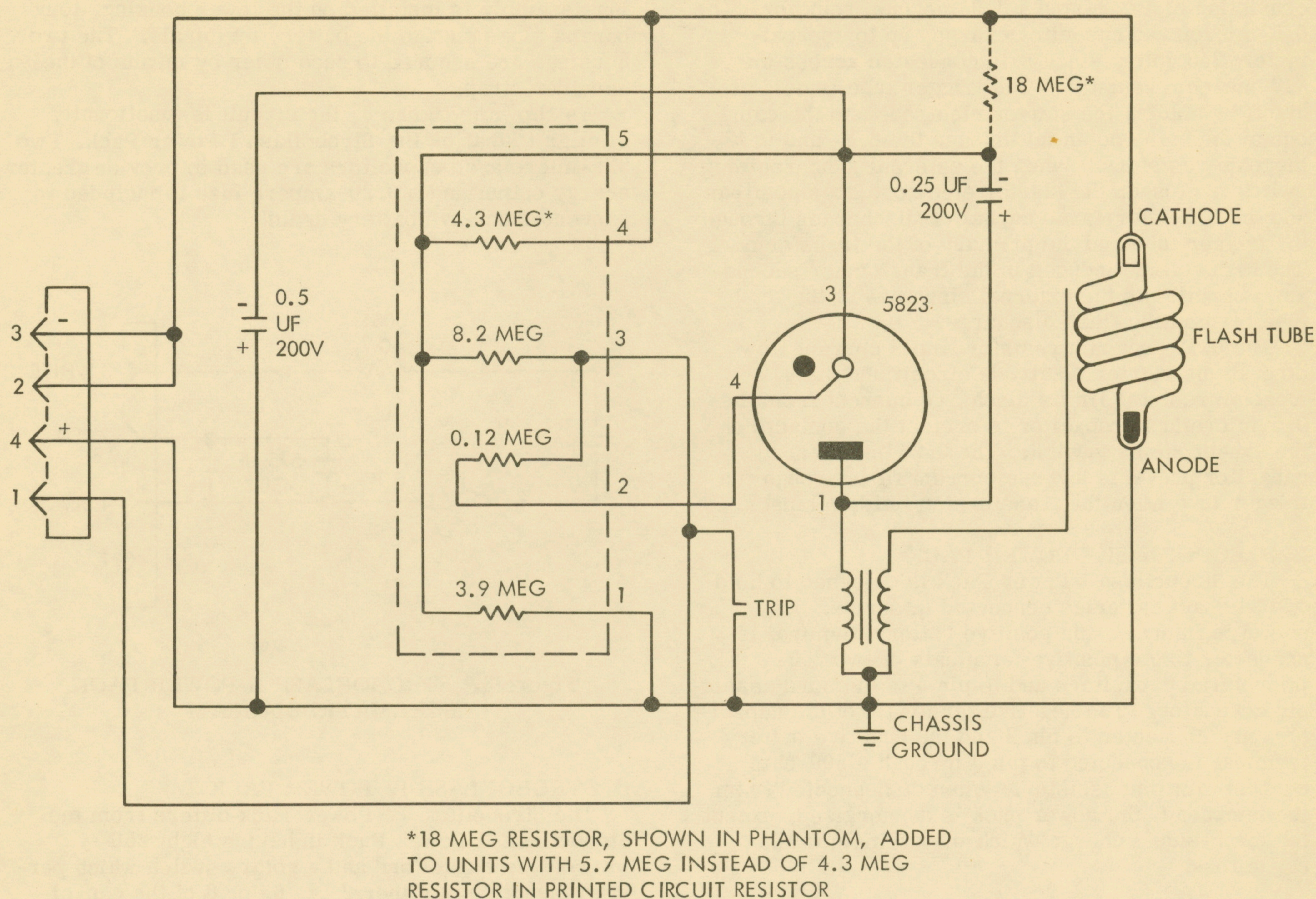


Figure 1. STROBOFLASH LAMPHEAD, SCHEMATIC DIAGRAM

INTRODUCTION

This section of the Graflex Service Parts Manual contains the service instructions and parts lists for the Stroboflash Lamphead and the Stroboflash I, II, and IV Power Packs. A list of replacement parts and applicable instructions for the Stroboflash III Power Pack (no longer available) are also included to facilitate repair of existing units.

A Stroboflash unit consists of a Stroboflash lamphead and one of the power packs. The Stroboflash unit provides high-intensity illumination of short duration when the accumulated charge of capacitors located in the power pack is discharged through a gas-filled electronic flash tube in the lamphead. The capacitors are recharged by direct connection to high-voltage batteries in the power pack. Synchronization is accomplished by a trigger circuit located in the lamphead under the control of an external switch.

A cord assembly extending from the power pack connects to a four-prong connector on the lamphead. The external synchronizing switch is connected to the trigger circuit through a two-prong connector on the lamphead. The unit is energized when the cord assembly is plugged into the connector on the lamphead.

A. STROBOFLASH LAMPHEAD

All components of the Stroboflash lamphead are mounted as an assembly within a formed housing. The electronic flash tube is designed for operation at approximately 450 volts dc. Triggering is accomplished by momentarily applying a high voltage to an external trigger electrode (a fine wire wound around the tube) to start ionization of the gas within the flash tube, causing it to become conductive.

As shown in figure 1, the cathode of the flash tube is connected to pins 2 and 3 of the four-prong connector. When the connector of the power pack is mated to the lamphead connector, this common connection functions as a switch to energize the power pack by connecting the negative battery lead to the negative terminals of the capacitors. The anode of the flash tube is connected through pin 4 of the connector to the positive (common) side of the batteries and capacitors. The full charge of the capacitors is, therefore, applied to the flash tube at all times. The flash tube is, however, normally non-conductive, becoming conductive when triggered.

The trigger circuit consists of the trigger tube, two capacitors, a resistor network, and a high-ratio step-up transformer. The full battery voltage from

the power pack is applied across a voltage divider consisting of a 4.3- and a 3.9-megohm resistor. The 0.5-microfarad capacitor charges up to approximately 215 volts, since it is connected across the 3.9-megohm resistor. The trigger tube is held at cutoff by holding the starter electrode and the cathode at the same potential through the 8.2- and 0.12-megohm resistors. When the external synchronizing switch is closed, the starter electrode goes positive and the 0.5-microfarad capacitor discharges through the trigger tube and the primary of the transformer. The high voltage induced in the transformer secondary is applied to the external electrode of the flash tube to start the flash discharge.

The 0.12-megohm resistor limits current flow through the starter electrode circuit and the 8.2-megohm resistor limits discharge current from the 0.5-microfarad capacitor to protect the contacts of the synchronizing switch. The 0.25-microfarad capacitor prevents inverse current flow through the trigger tube when the transformer field collapses.

B. STROBOFLASH I POWER PACK

The Stroboflash I Power Pack is designed to hold two 240-volt batteries connected in series. As shown in figure 2, the positive battery terminal is connected to the positive terminals of two 250-microfarad capacitors and to pin 4 of the cord assembly connector. The negative terminals of the capacitors are connected to pin 2 and the negative battery terminal is connected to pin 3 through a 500-ohm current-limiting resistor. When disconnected from the lamphouse, the power pack is deenergized, except for the residual charge which may remain in the capacitors.

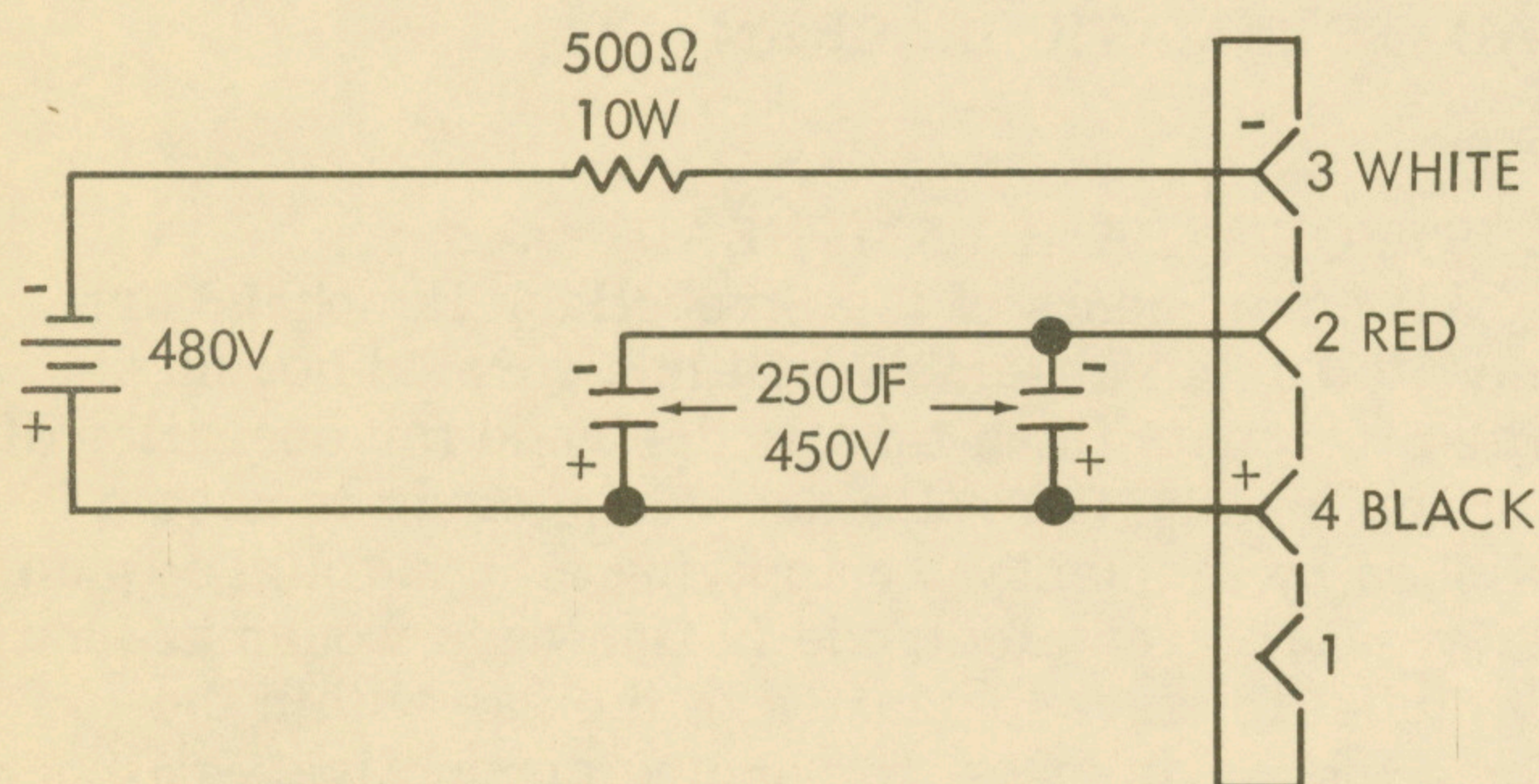


Figure 2. STROBOFLASH I POWER PACK, SCHEMATIC DIAGRAM

When the power pack cable assembly is plugged into the connector on the lamphouse, pins 2 and 3 are interconnected and the capacitors begin charging. The 500-ohm resistor limits the charging current to prevent excessive drain on the batteries and ensures cutoff of the flash tube after the flash discharge.

C. STROBOFLASH II POWER PACK

The Stroboflash II Power Pack is designed for carrying two 225-volt batteries in a lower housing. The capacitors and other circuit elements are located

in an upper housing assembly. When the upper housing assembly is installed on the lower housing, four banana plugs engage the battery terminals. The two housings are secured to each other by means of the shoulder strap.

As shown in figure 3, the circuit is functionally similar to that of the Stroboflash I Power Pack. Two 525-microfarad capacitors are used to provide greater energy output and a 0.20-ampere fuse is included to prevent excessive battery drain.

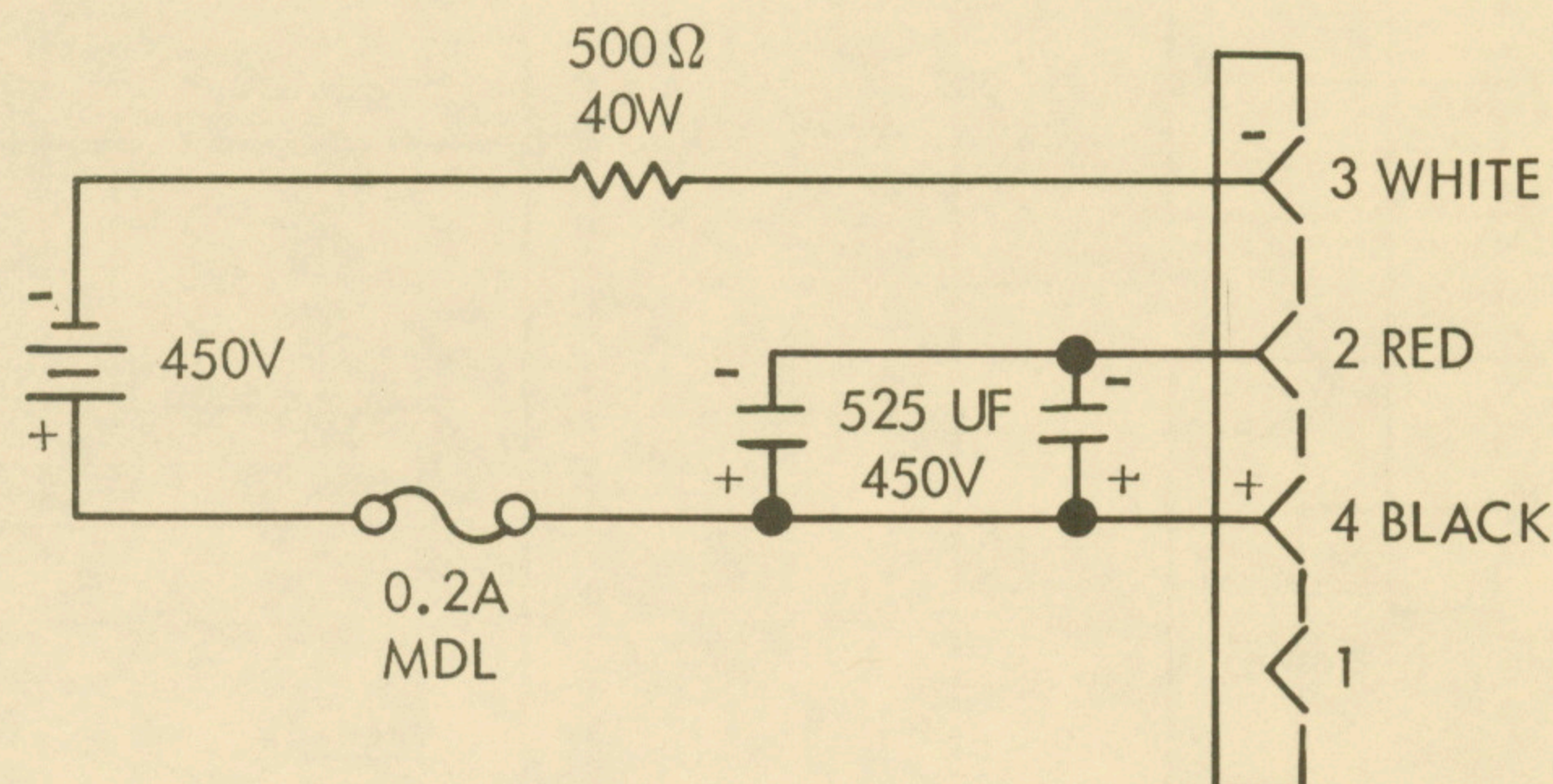


Figure 3. STROBOFLASH II POWER PACK, SCHEMATIC DIAGRAM

D. STROBOFLASH IV POWER PACK

The Stroboflash IV Power Pack differs from the Stroboflash II Power Pack in having eight 250-microfarad capacitors and a rotary switch which permits insertion of either 2, 4, 6, or 8 of the capacitors into the circuit, as shown in figure 4. Two 1500-ohm resistors in parallel limit the charging current and a 1/4-ampere fuse is used to protect the batteries.

E. STROBOFLASH TROUBLESHOOTING CHART

Potential troubles, causes, and remedies are given in the troubleshooting chart on page 4, to expedite service of common difficulties.

F. SERVICE EQUIPMENT

1. Stroboflash Master Tester (see figure 5)

NOTE: Paragraphs G and H and figures 5 through 8 provide necessary information for construction, operation, and calibration of the master tester.

2. Capacitor analyzer
3. A sensitive volt-ohmmeter (1000 ohms, or more, per volt)
4. A variable voltage transformer (100 volt-amperes capacity)
5. Stroboflash Battery Analyzer
6. Battery booster for Stroboflash
7. Miscellaneous tools, such as: soldering iron, pliers, screwdrivers, etc.
8. Rosin flux core solder whose alloy is 50% tin and 50% lead, such as:

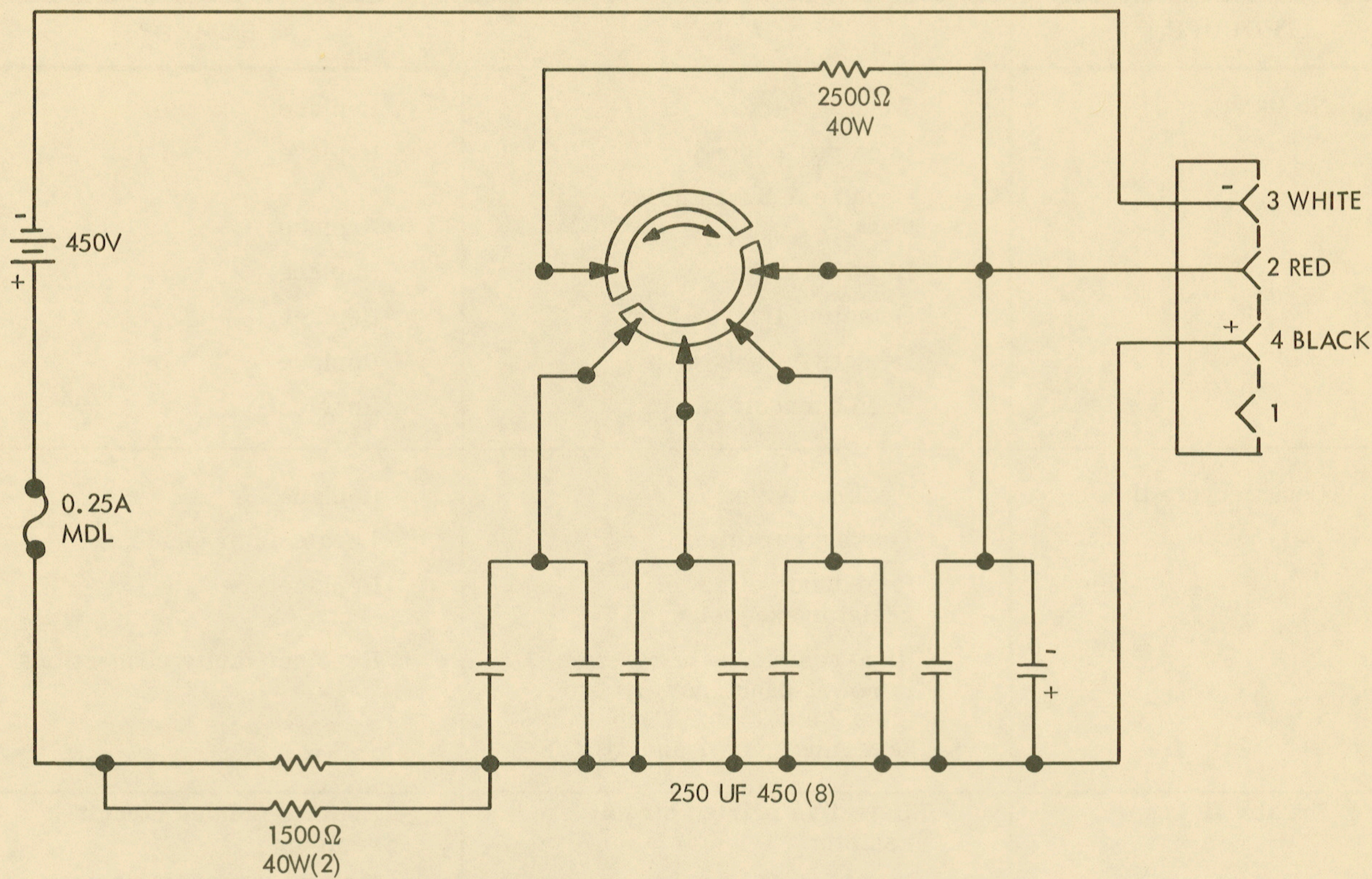


Figure 4. STROBOFLASH IV POWER PACK, SCHEMATIC DIAGRAM

Kester #44

Kester Solder Co.
Chicago 39, IllinoisMulticore Solder
Ersin FluxMulticore Sales, Inc.
New York 13, New York**CAUTION:** Never use an acid flux or acid core solder on electrical equipment.**G. STROBOFLASH MASTER TESTER**

The Stroboflash Master Tester is a special piece of test equipment that provides for checking all electrical functions of the Stroboflash equipment. This equipment will help to isolate trouble areas within the electrical circuits of the lamphead or power pack with minimum time and effort. An equivalent tester may be constructed locally by referring to figures 5 through 8 and the list of materials given on page 7.

H. TEST SETUP

1. Connect the negative (red) lead of the volt-ohmmeter to pin jack J5 at the rear of the master tester and connect the positive (black) lead to pin jack J6.
2. Set the volt-ohmmeter for an indication of 500 volts dc.
3. Connect the master tester power cord to the output of the variable voltage transformer and set the transformer for 0 volts output.
4. Connect the variable voltage transformer to a source of 110-volt, 60-cps, power.

5. Set POWER switch S1 to ON position.
6. Set HI/LO switch S3 to HI position.
7. Set BATTERY PACK/POWER SUPPLY switch S4 to POWER SUPPLY position.
8. Adjust variable voltage transformer to obtain an indication of 450 volts on the volt-ohmmeter. POWER ON indicator lamp DS1 shall glow.
9. Set HI/LO switch to LO position. Volt-ohmmeter shall read 350 volts.

NOTE: If incorrect indication is obtained in step 9, adjust output of variable voltage transformer to 117 volts ac. Then, adjust rheostat R1 for an indication of 450 volts dc on the volt-ohmmeter with HI/LO switch S3 in HI position. Set HI/LO switch to LO position and adjust rheostat R2 for an indication of 350 volts dc on the volt-ohmmeter.

I. TEST PROCEDURES

The master tester is essentially a simulator. Isolation of lamphead and power pack troubles to specific circuits is accomplished by substitution of circuits and components known to be good. Provision is also made for testing major component parts of the equipment.

1. LAMPHEAD TESTS

- a. Connect receptacle J3 of the master tester to the four-pronged connector on the lamphead.

TROUBLESHOOTING CHART

TROUBLE	CAUSE	REMEDY
No flash	Weak batteries Open power cord Open resistor in power pack Blown fuse Defective trigger tube Defective flash tube Open connection	Replace Replace Replace Replace Replace Replace Resolder
Long recycle time	Weak batteries Leaking capacitor Resistance of power resistor excessive High-resistance connection in power pack, power cord (pins 2 and 3), or lamp-head plug (pins 2 and 3)	Replace Locate and replace Replace Resolder faulty connections
Erratic firing	Defective printed circuit resistor Highly humid conditions Reversed polarity (camera shutter cord)	Replace printed circuit resistor Moistureproof trip circuit (refer to paragraph J. 2) Reverse plug in socket
Flash tube glows after firing	Shorted power pack connecting cord Resistor in power pack shorted	Replace Replace

b. Energize master tester, following the procedures in steps 5 through 9 of paragraph H. Red indicator lamp DS3 shall glow. If red indicator lamp DS3 does not glow, shorting connection between pins 2 and 3 of lamphead connector is open.

c. Set HI/LO switch S3 to LO position.

d. Press FLASH LAMP TRIGGER pushbutton S5; wait 10 seconds and press pushbutton a second time. Lamphead flash tube shall fire each time pushbutton is pressed. If not, disassemble lamphead and test flash tube, trigger tube, capacitors, printed circuit resistors, and transformer as outlined in paragraphs I. 2, I. 3, I. 8, I. 9, and I. 10, respectively.

NOTE: Prior to disassembly and testing of individual component parts, examine all wiring and soldered connections for visible defects. Save time by correcting all visible defects and retesting lamphead before disassembling further.

e. Set HI/LO switch in HI position. Observe that flash tube does not fire during a minimum period of 15 seconds. If flash tube does fire, remove and test flash tube and trigger tube.

f. Press FLASH LAMP TRIGGER pushbutton. Flash tube shall fire and no after-glow shall be present after flash tube extinguishes. If after-glow is present, disassemble lamphead and test the component parts specified in step d above.

2. FLASH TUBE TEST

a. Insert a trigger tube (RCA No. 5823), known to be good, in socket XV3 on master tester.

b. Remove flash tube safety cover from jacks J4 and insert flash tube to be tested in socket XV1. Replace safety cover.

c. Set BATTERY PACK/POWER SUPPLY switch S4 in POWER SUPPLY position.

d. Set HI/LO switch S3 in LO position.

e. Energize master tester.

f. Press FLASH HEAD TRIGGER pushbutton S6. Flash tube shall fire. Wait ten seconds and press FLASH HEAD TRIGGER pushbutton a second time. Flash tube shall fire. Discard flash tubes which do not fire.

g. Set HI/LO switch to HI position. Allow ten seconds to check that flash tube does not self-fire.

h. Press FLASH LAMP TRIGGER pushbutton and observe flash tube for after-glow. Discard flash tube if after-glow is present.

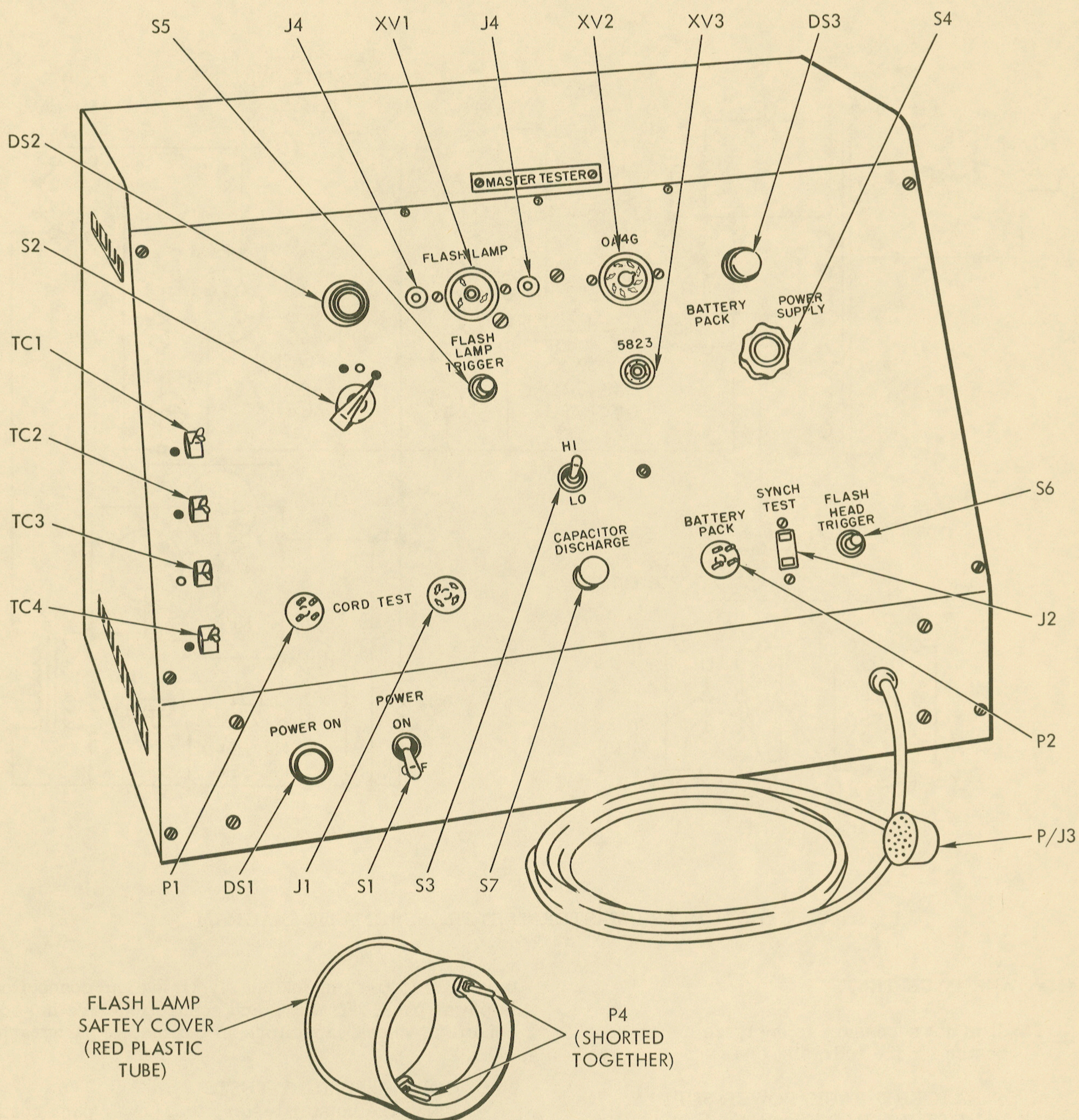


Figure 5. STROBOFLASH MASTER TESTER, FRONT VIEW

3. TRIGGER TUBE TEST

a. Remove flash tube safety cover from jacks J4 and insert a flash tube known to be good in socket XV1. Replace safety cover.

b. Insert trigger tube to be tested in socket XV3.

NOTE: To test OA4G type trigger tubes, insert tube in socket XV2.

c. Energize master tester.

d. Set BATTERY PACK/POWER SUPPLY switch S4 in POWER SUPPLY position.

e. Set HI/LO switch S3 in LO position.

f. Press FLASH HEAD TRIGGER pushbutton S6 three times at 10-second intervals. Flash tube shall fire each time pushbutton is pressed. Discard trigger tube if flash tube fails to fire one or more times.

g. Set HI/LO switch to HI position. Allow 15 seconds to check that flash tube does not self-fire. Discard trigger tube if flash tube self-fires.

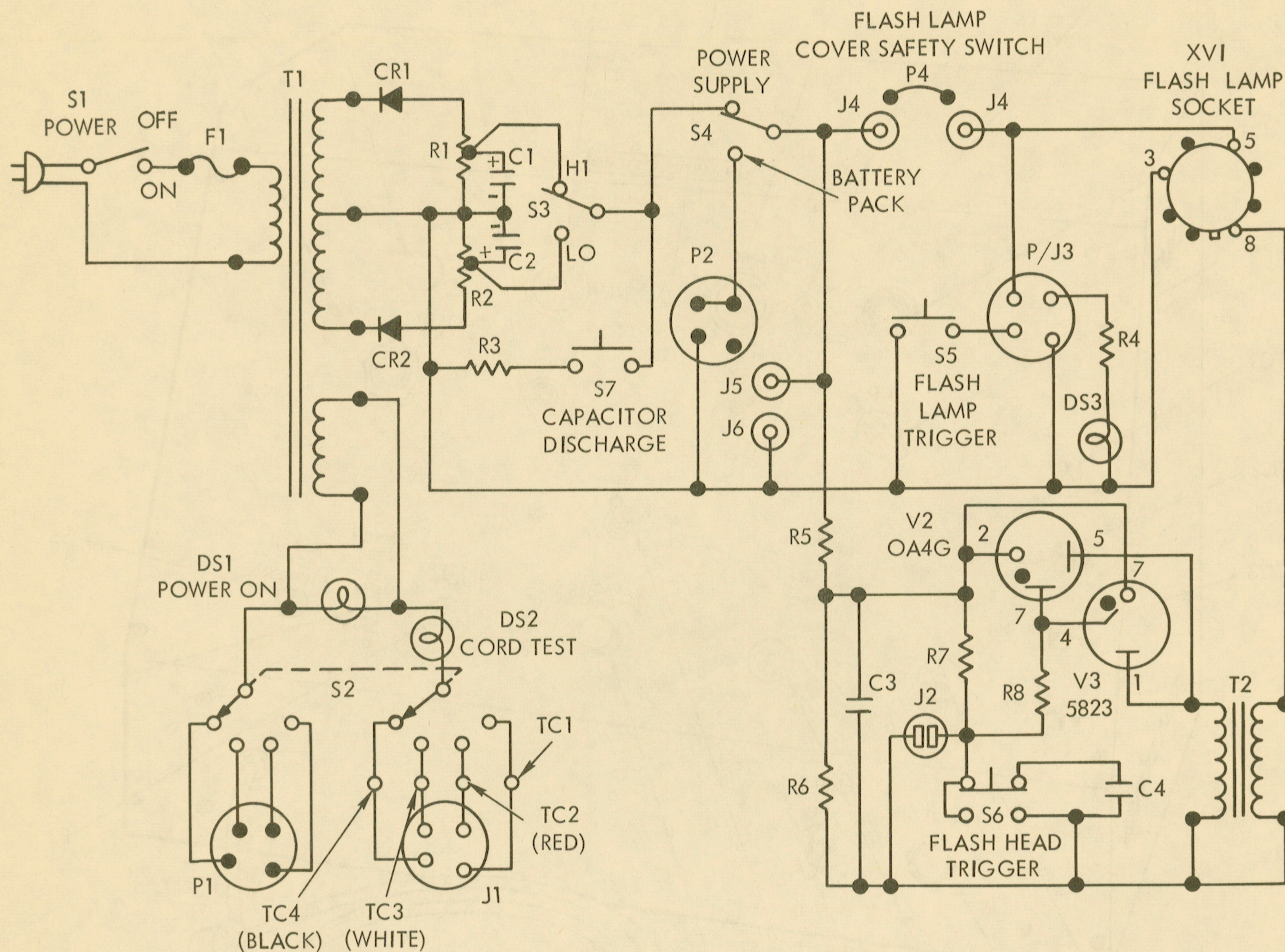


Figure 6. STROBOFLASH MASTER TESTER, SCHEMATIC DIAGRAM

4. POWER PACK TESTS

NOTE: It is not necessary to energize the master tester for the following tests.

- Set BATTERY PACK/POWER SUPPLY switch S4 in BATTERY PACK position.
- Connect cord assembly of power pack to plug P2 of master tester.
- Check indication of volt-ohmmeter. Indication shall be above 360 volts dc for Strobflash I Power Pack and above 360 volts dc for Strobflash II and IV Power Packs. Replace batteries in power pack if indication is not above the value specified.
- Install a trigger tube known to be good in socket XV3 on master tester.
- Remove flash tube safety cover from jacks J4 and install a flash tube known to be good in socket XV1. Replace safety cover.
- Press FLASH HEAD TRIGGER pushbutton switch S6. Flash tube shall fire. When volt-ohmmeter indication reaches maximum, press switch a second time. Flash tube shall again fire. If flash

tube fails to fire, check out all wiring and connections in power pack. If wiring and connections are in good condition, check capacitors as outlined in paragraph I. 8.

5. CORD ASSEMBLY TESTS

Using the master tester, test power pack cord assembly as follows:

- Remove batteries from power pack.

WARNING: BEFORE PROCEEDING, CONNECT A 500-OHM, 12-WATT RESISTOR ACROSS THE TERMINALS OF EACH CAPACITOR IN TURN FOR A MINIMUM OF TEN SECONDS TO BE CERTAIN CAPACITORS ARE DISCHARGED. TAKE PROPER PRECAUTIONS TO AVOID CONTACT WITH HIGH-VOLTAGE LEADS OR TERMINALS UNTIL CAPACITORS ARE DISCHARGED. INJURY MAY RESULT IF THESE PRECAUTIONS ARE NOT OBSERVED.

(Continued Page 8)

LIST OF MATERIALS FOR STROBOFLASH MASTER TESTER

REF. DES.	DESCRIPTION	QTY.
C1, C2	Capacitor, Electrolytic, 525 uf, 450V DC (Graflex part no. 35526-P2)	2
C3	Capacitor, Fixed, 0.5 uf, 200V DC (Graflex part no. 35535-P11)	1
C4	Capacitor, Fixed, 0.25 uf, 200V DC (Graflex part no. 35535-P12)	1
CR1, CR2	Rectifier, selenium (or silicon), 400V, 100 ma. minimum	2
DS1	Pilot light with no. 47 lamp, Drake no. 50 (with amber jewel)	1
DS2	Pilot light with no. 47 lamp, Drake no. 60 (with red jewel)	1
DS3	Pilot light with no. 51 lamp, Dialco no. 95408-937	1
F1	Fuse, 3AG, 1 amp	1
J1	Connector, female, 4-pin, Amphenol no. 78-S4S	1
J2	Socket, a-c type (Graflex part no. 38942-P1)	1
J4	Socket, banana plug type	2
J5	Pin jack, red	1
J6	Pin jack, black	1
P1, P2	Connector, male, 4-pin, Amphenol no. 86-CP-4S	2
P/J3	Connector (male/female) and cable (Graflex part no. 35645-G1 ref Cat. No. 2050) use one end	1
P4	Banana plug	2
R1	Resistor, wire wound, 50K ohms, 50 watts, adjustable	1
R2	Resistor, wire wound, 60K ohms, 50 watts, adjustable	1
R3	Resistor, fixed, composition, 500 ohms, 5 watts	1
R4	Resistor, fixed, composition, 500 ohms, 1/2 watt	1
R5	Resistor, fixed, composition, 4.3 megohms, 1/2 watt	1
R6	Resistor, fixed, composition, 3.9 megohms, 1/2 watt	1
R7	Resistor, fixed, composition, 8.2 megohms, 1/2 watt	1
R8	Resistor, fixed, composition, 0.12 megohm, 1/2 watt	1
S1	Switch, toggle, S. P. S. T.	1
S2	Switch, 4-pole, double-throw, rotary, Mallory no. 3234J	1
S3	Switch, 3-pole, single throw, Centralab no. 1415	1
S4	Switch, D. P. S. T., Mallory no. 3242J	1
S5, S7	Switch, S. P. S. T., momentary contact, normally open	2
S6	Switch, S. P. D. T., momentary contact	1
T1	Transformer, power, 720V C.T. at 120 ma., 6.3V at 3 amp.	1
T2	Transformer, trigger, Electran no. H-3609-B (Graflex part no. 35693-P1)	1
TC1, TC2 TC3, TC4	Clip, test, Grayhill no. 2-0	4
V1	Flash tube, Kemlite no. U5W, for use as test standard (Graflex part no. 35544-P1)	1
V2	Tube, type OA4G	1
V3	Tube, type 5823 (Graflex part no. 35534-P4)	1
XF1	Fuseholder (for 3AG size fuse)	1
XV1, XV2	Socket, tube, octal	2
XV3	Socket, tube, 7-pin miniature	1
	Power cord with plug Chassis, aluminum, 10 in. x 17 in. x 3 in. Panel, front	1 ea

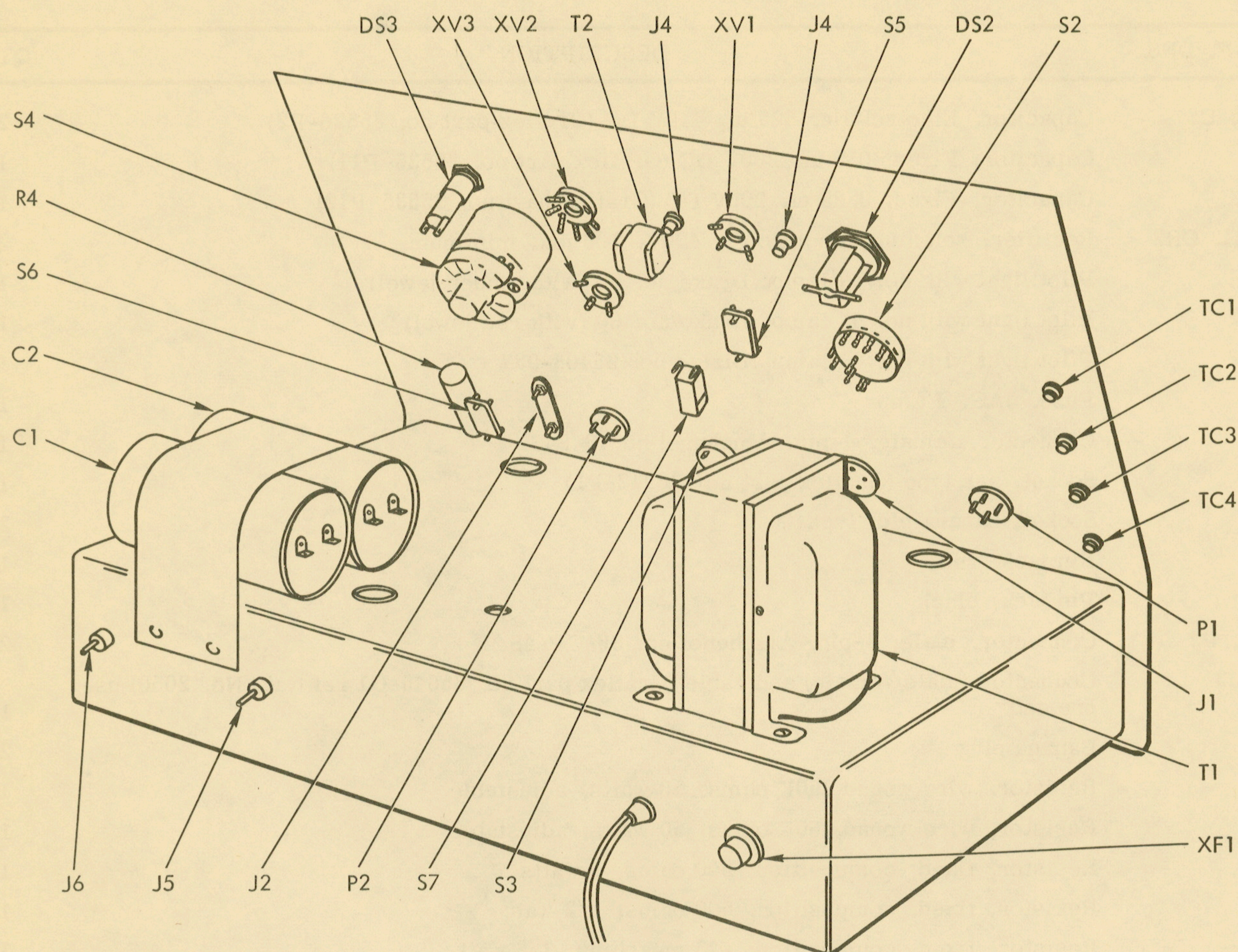


Figure 7. STROBOFLASH MASTER TESTER, REAR VIEW

b. Connect receptacle of cord assembly to plug P1 on master tester.

c. Using test leads, connect test clips TC2 through TC4 to leads of cord assembly in power pack, mating color of leads to color of dot at test clip.

d. Energize master tester.

e. Set selector switch S2 on master tester to red dot. CORD TEST lamp DS2 shall light. Gently bend and twist cord throughout its length. CORD TEST lamp shall not flicker. Replace cord if lamp fails to light or if lamp flickers.

f. Repeat step e with selector switch at white dot and then at black dot.

6. Using a volt-ohmmeter, test power pack cord assembly as follows:

a. Remove batteries from power pack.

b. Discharge capacitors as instructed in WARNING, paragraph 5. a.

c. With volt-ohmmeter set for resistance measurements (R x 1 scale), measure resistance between each contact of cord connector and the corresponding lead terminal (refer to the schematic diagrams, figures 2 through 4, for corresponding

contacts and terminals). Resistance in each case shall be less than one ohm. Check to be certain that resistance does not fluctuate as cord is gently moved and twisted. Replace cord assembly if it fails to meet these requirements.

7. BATTERY TEST

Condition of batteries is obtained by measuring the output voltage under standard load conditions. To test individual batteries, the output voltage may be measured, with a Strobeflash Battery Analyzer. With analyzer switch in "LOAD TEST" position, batteries rated at 240 or 225-volts should be replaced, if reading is 175-volts or less.

8. CAPACITOR TEST

Test capacitors using a capacitor analyzer. Leakage of the 525-microfarad capacitors should not exceed 3.0-milliamperes after 10 minutes at 450-volts. Leakage of the 250-microfarad capacitors should not exceed 1.8-milliamperes after 10 minutes at 450-volts.

Replace capacitors not meeting the test requirements.

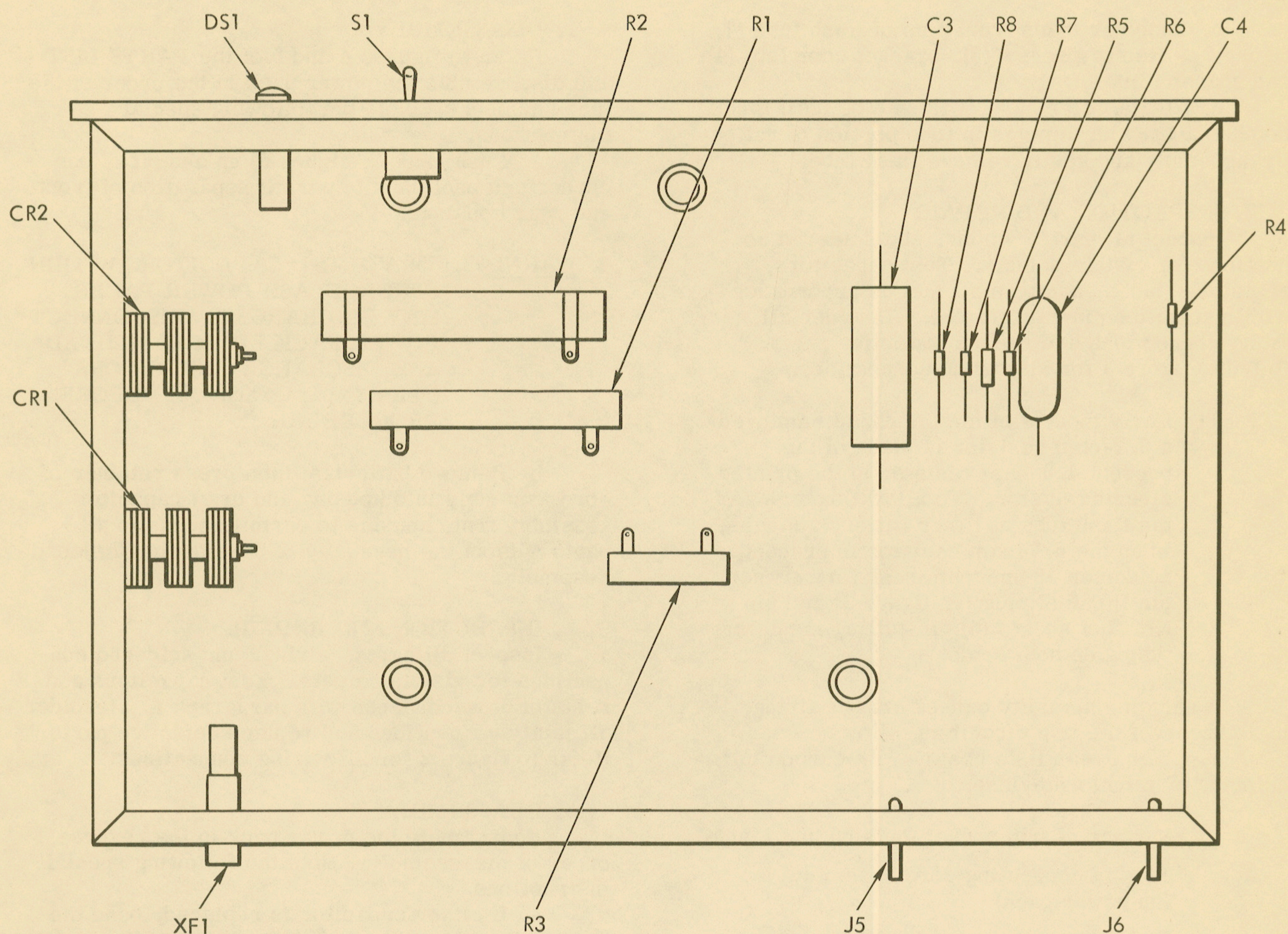


Figure 8. STROBOFLASH MASTER TESTER, BOTTOM VIEW

9. RESISTOR TEST

Measure the resistance of all resistors, using the volt-ohmmeter. Replace the resistor or the printed circuit resistor assembly if any resistance value is not within 10 percent of the value indicated on the applicable schematic diagram.

CAUTION: Remove batteries and discharge capacitors in the unit before making resistance measurements. Serious damage to meter may result if this precaution is not taken.

10. TRANSFORMER TEST

Using the volt-ohmmeter as an ohmmeter, measure the resistance of the primary and secondary windings of the transformer. Resistance of primary winding (bare wire to yellow wire) shall be approximately 0.4 ohm. Resistance of secondary winding (bare wire to red wire) shall be approximately 620 ohms. Replace transformer if either winding does not have approximately correct resistance.

11. EXTENSION CORD TEST

The 20-foot extension cord (an accessory for use with any Strobflash unit) may be tested for

continuity, using the volt-ohmmeter. To test the cord with the master tester, proceed as follows:

a. Connect female connector of extension cord to plug P1 on master tester.

b. Connect male connector of extension cord to jack J1.

c. Energize master tester.

d. Set selector switch S2 on master tester to red dot. CORD TEST lamp shall light. Gently bend and twist cord throughout its length; CORD TEST lamp shall not flicker. Replace cord if lamp fails to light or if lamp flickers.

e. Repeat step d, with selector switch at white dot and then at red dot.

J. SERVICING LAMPHEAD ASSEMBLY

1. DISASSEMBLY

Refer to figures 1, 2, and 3 of the PARTS LIST and disassemble the lamphead in the order of the index numbers. Note the following special instructions.

a. Squeeze the top and bottom of lamp housing assembly (1, figure 1) together so as to expand the sides to clear plug (7, figure 3) and socket (8).

Then draw lamp housing assembly from chassis assembly.

b. Unsolder leads from pins of flash tube (7, figure 2). Remove screw (5), bracket complete (4), and spacer (6).

c. Rotate wafer base of flash tube until three notches align with dimples in tube portion of reflector assembly and gently remove flash tube.

2. INSPECTION AND REPAIR

Inspect all parts, wiring, and soldered connections for visible defects. Test capacitors, resistors, tubes, and transformer in accordance with instructions in paragraph I. Resolder all faulty connections and replace defective parts. Refer to figure 1 for all wiring connections.

NOTE: Early models of the lamphead employed a 5.7-ohm resistor in place of the present 4.3-ohm resistor in the printed circuit resistor. To allow triggering of the flash tube at lower battery voltages, when the 5.7-ohm resistor is present, solder an 18-megohm resistor between pin No. 2 of plug (7, figure 3) and pin No. 3 of socket (6), installing insulating tubing on both leads.

If extreme humidity causes erratic firing, moistureproof the trip circuit as follows:

a. Clean areas listed below with carbon tetrachloride or trichlorethylene.

Surface of trip socket (outside and inside)

Plug of connecting cord assembly
(on power pack)

Wafer base of flash tube (both sides)

Trigger tube socket (both sides)

Surfaces of power plug (on lamphead)

b. Apply a thin coat of Dow Corning No. 4 Silicone Compound to the areas cleaned in the previous step, making certain not to apply compound to pins or socket contacts of connectors or flash tube.

3. REASSEMBLY

Reassemble the lamphead in the reverse order of disassembly. Note the following special instructions.

a. Cover leads to terminals 2, 3, and 5 of printed circuit resistor (4, figure 3) with insulation tubing (3, figure 2). Also cover lead from four-prong socket to flash tube with a similar length of insulation tubing.

b. When installing flash tube, make certain to rotate wafer base so that notches in base are between dimples in reflector assembly.

c. Press bracket complete (4, figure 2) and spacer (6) against reflector assembly when tightening screw (5).

d. Orient dust shield (2, figure 1) with its small shoulder facing out.

K. SERVICING STROBOFLASH I POWER PACK

1. DISASSEMBLY

Refer to figures 4 and 5 of the PARTS LIST and disassemble the power pack in the order of the index numbers. Note the following special instructions.

a. Push seal (9, figure 5) up and off of one corner and peel back to permit separation of front and rear housings.

WARNING: 450 VOLTS! CAPACITORS WITHIN STROBOFLASH POWER PACKS MAY BE CHARGED. DISCONNECT POWER PACK FROM LAMPHEAD AND DISCHARGE CAPACITORS (refer to paragraph I. 5) BEFORE PROCEEDING.

b. Remove batteries; then press retainer of cord assembly into housing and draw capacitor assembly from housing to permit access to all parts without the necessity of unsoldering the cord assembly.

2. INSPECTION AND REPAIR

Inspect all parts, wiring, and soldered connections for visible defects. Test capacitors and resistor in accordance with paragraph I. Resolder all faulty connections and replace defective parts. Refer to figure 2 for all wiring connections.

3. REASSEMBLY

Reassemble the power pack in the reverse order of disassembly. Note the following special instructions.

a. If either capacitor is replaced, bend the terminal soldered to strap assembly (8, figure 4) flat so as to minimize its height above the strap assembly.

b. Make certain that positive terminals of capacitors are connected to strap assembly and that negative terminals are interconnected.

c. If shoulder strap (3, figure 5) is replaced, the replacement part will be found to have a smaller diameter than the original to facilitate installation. Assemble strap slides on replacement shoulder strap as shown in figure 9 to be certain that strap does not slip in slide.

L. SERVICING STROBOFLASH II POWER PACK

1. DISASSEMBLY

Refer to figures 6, 7, and 8 of the PARTS LIST and disassemble the power pack in the order of the index numbers. Note the following special instructions.

WARNING: 450 VOLTS! CAPACITORS WITHIN STROBOFLASH POWER PACKS MAY BE CHARGED. DISCONNECT POWER PACK FROM LAMPHEAD AND DISCHARGE CAPACITORS (refer to paragraph I. 5) BEFORE PROCEEDING.

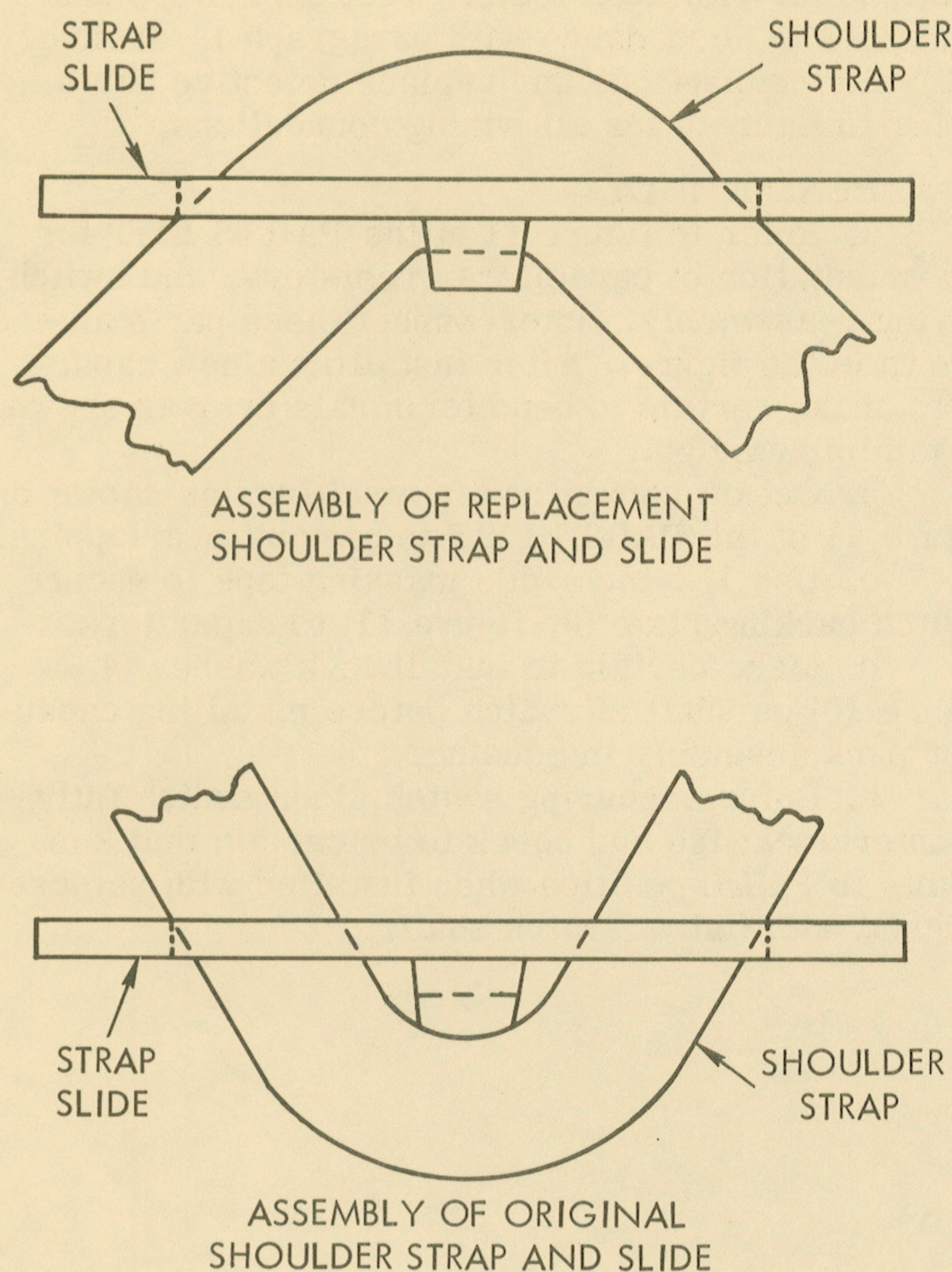


FIGURE 9. METHOD OF INSTALLING STRAP SLIDES ON SHOULDER STRAPS

a. When separating upper and lower housing assemblies, pull upper assembly directly up to disengage banana plugs from batteries.

b. After removing retaining rings (1, figure 7), squeeze sides of upper housing to expand ends so that they will clear teenuts on tray assembly.

2. INSPECTION AND REPAIR

Inspect all parts, wiring, and soldered connections for visible defects. Test capacitors and resistors in accordance with paragraph I. Resolder all faulty connections and replace defective parts. Refer to figure 3 for all wiring connections.

Check wattage rating of resistor. If resistor is rated at 20 watts, unsolder and remove the old resistor and install a new resistor as follows:

NOTE: The 20-watt resistor was used on early models and tends to overheat and burn the case when short-interval flashing is continued for a long period.

a. Cut out a 3/4-inch length from the center of each sponge rubber cushion.

b. Unsolder wire leading from positive battery plug to capacitor bar to which black cord assembly lead is connected.

c. Solder a 3-1/8-inch length of No. 22 AWG, tinned solid copper bus wire between open fuse terminal and open negative battery terminal.

NOTE: This wire must be free of excessive play to ensure that it cannot contact teenut in end of capacitor tray.

d. Slip a grommet (7, figure 8) on each end of a resistor (8) to absorb shock.

e. Solder one resistor terminal to capacitor bus bar which is connected to black lead of cord assembly. Solder second resistor lead to positive battery plug. Make certain that wires cannot contact each other. Lift capacitor cushion and run wire to battery plug under cushion. Recement cushion.

f. Orient resistor in center of tray between capacitors.

3. REASSEMBLY

Reassemble the power pack in the reverse order of disassembly. Note the following special instructions:

a. If one or both capacitors are replaced, make certain to connect capacitor terminals with polarity marks together.

b. Make certain that lead wires from resistor cannot come into contact with teenuts on tray assembly.

c. After placing capacitors in tray assembly, make certain that wires are not fouled under the capacitors.

M. SERVICING STROBOFLASH III POWER PACK

To facilitate the repair of Strobflash III Power Packs (no longer available), a listing of replacement parts has been included in the PARTS LIST. This model is very similar to the Strobflash IV Power Pack and the servicing instructions for the Strobflash IV Power Pack are generally applicable. Refer to figure 10 for wiring connections.

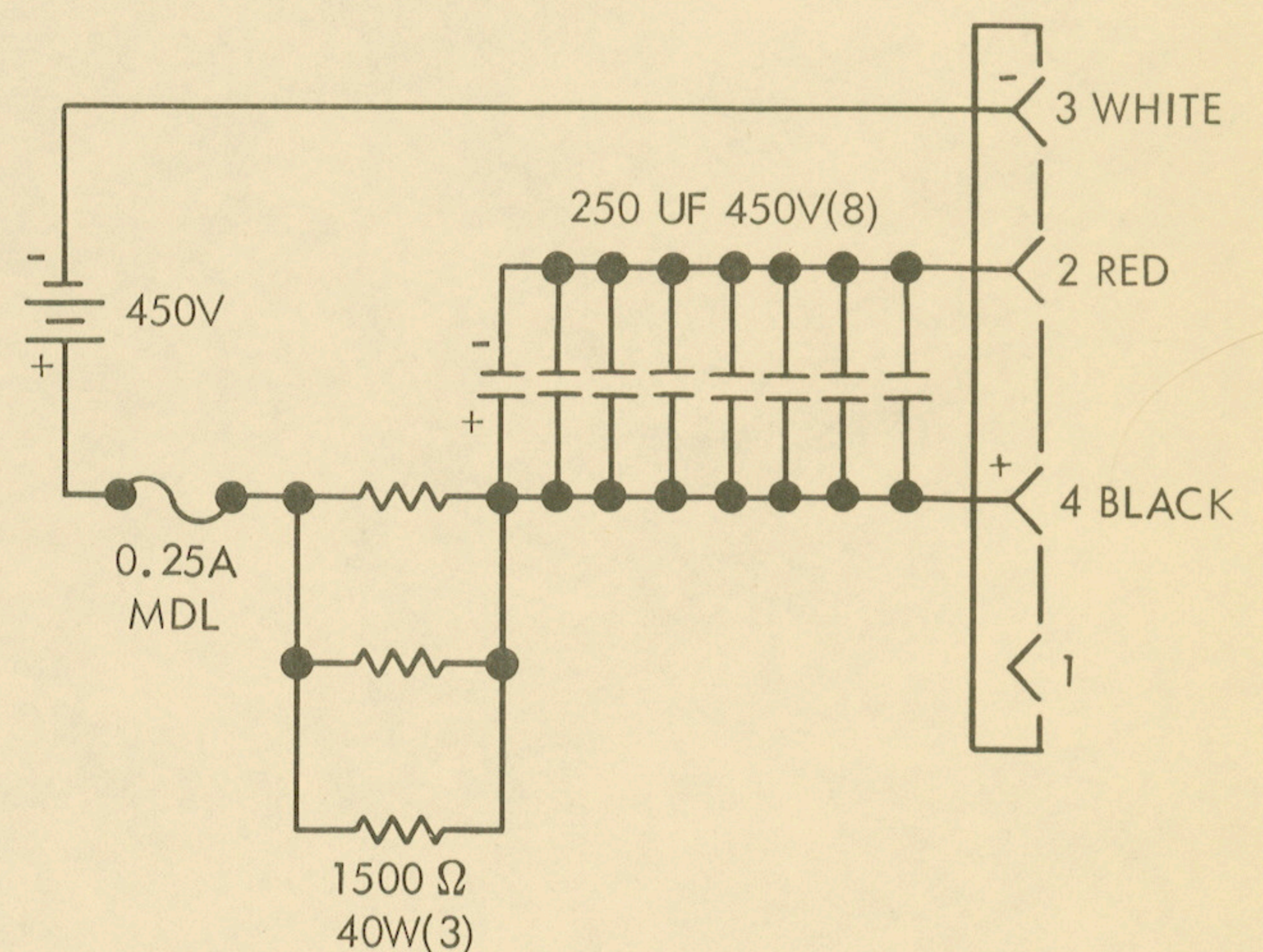


Figure 10. STROBOFLASH III POWER PACK, SCHEMATIC DIAGRAM

N. SERVICING STROBOFLASH IV POWER PACK

1. DISASSEMBLY

Refer to figures 9, 10, and 11 of the PARTS LIST and disassemble the power pack in the order of the index numbers. Note the following special instructions.

WARNING: 450 VOLTS! CAPACITORS WITHIN STROBOFLASH POWER PACKS MAY BE CHARGED. DISCONNECT POWER PACK FROM LAMPHEAD AND DISCHARGE CAPACITORS (refer to paragraph 1.5) BEFORE PROCEEDING.

a. When separating upper and lower housing assemblies, pull upper assembly directly up to disengage banana plugs from batteries.

b. After removing retaining rings (1, figure 10), squeeze sides of upper housing to expand ends so that they will clear teenuts on tray assembly.

2. INSPECTION AND REPAIR

Inspect all parts, wiring, and soldered connections for visible defects. Test capacitors and resistors in accordance with paragraph I. Resolder all faulty connections and replace defective parts. Refer to figure 4 for all wiring connections.

3. REASSEMBLY

a. Refer to figure 11 of the PARTS LIST for the orientation of capacitors, resistors, and switch during reassembly. Interconnect these parts as shown in the figure. After installing a new capacitor, make certain to bend terminals over as shown to minimize height.

b. Cut off capacitor terminal lugs as shown in figure 11 of the PARTS LIST to prevent overlapping.

c. Use 1/2-inch wide masking tape to secure switch backing plate (8, figure 11) to capacitors.

d. Make certain to install lock washer (4, figure 10) on shaft of switch before installing capacitor pack assembly in housing.

e. Before securing switch, turn switch fully counterclockwise and check to be certain that knob points to FULL position when installed with setscrew aligned with flat of switch shaft.

PARTS LIST

The Group Assembly Parts Lists are listed in disassembly order. The list divides the components into major assemblies, their subassemblies and parts. By the use of indented columns, the relationship of the assemblies to the subassemblies and parts is obtained.

The column titled "Figure and Index No." contains the index number in disassembly order of the items illustrated. Do not use the figure or index number in correspondence--specify the Graflex part number and name.

The column titled "nomenclature" (including numbered columns) lists item nomenclature on the Graflex drawing. The assembly in the column marked "3" will be a component of the first assembly which preceded it in the column marked "2" etc. The code "NP" will indicate that this part is "not procurable" and that the "next higher assembly" (NHA) should be ordered. The code "AR" is used for bulk items when an indefinite amount may or may not be used "as required." The code "LP" is used when an item may be "locally purchased."

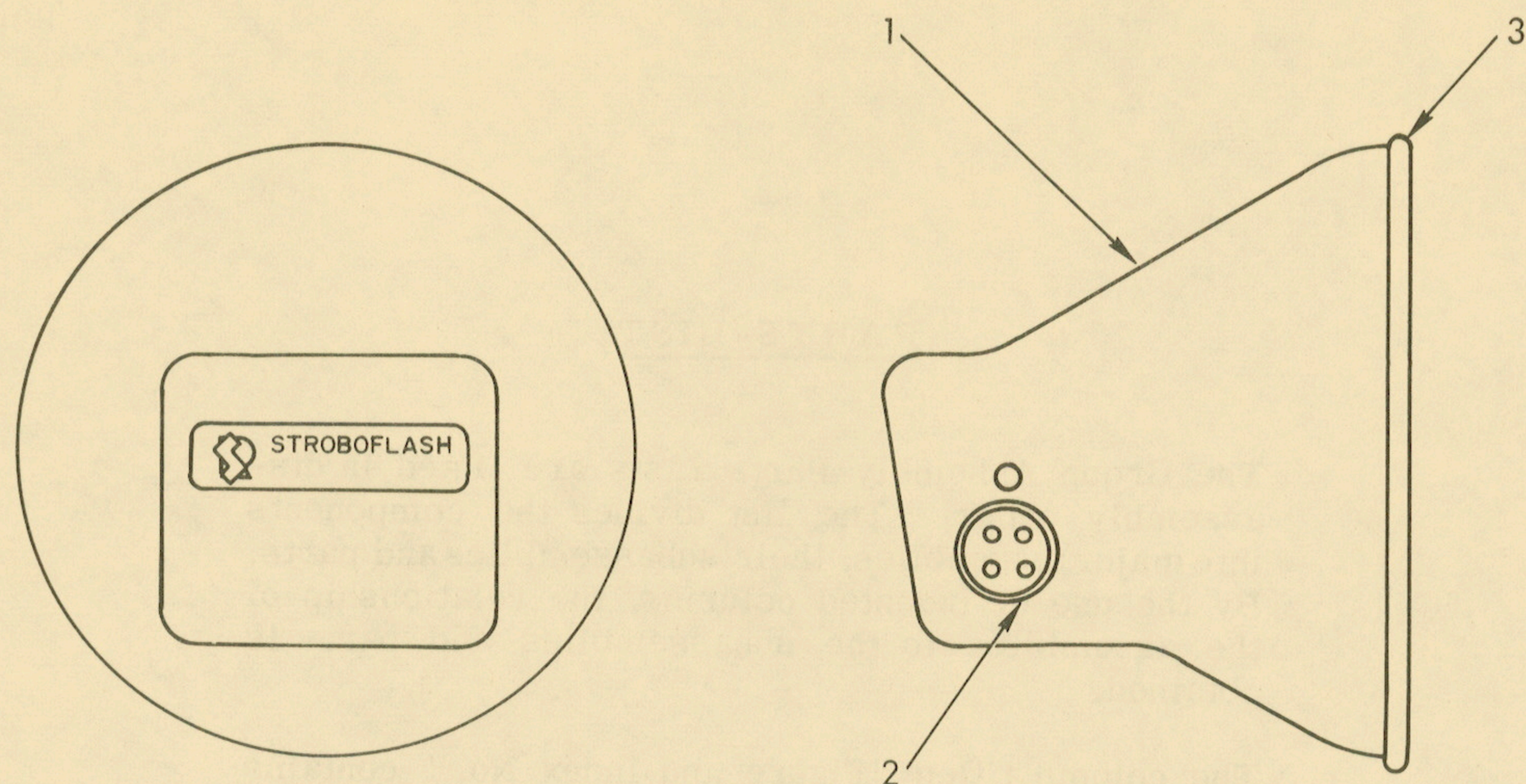


Figure 1. STROBOFLASH LAMP COMPLETE

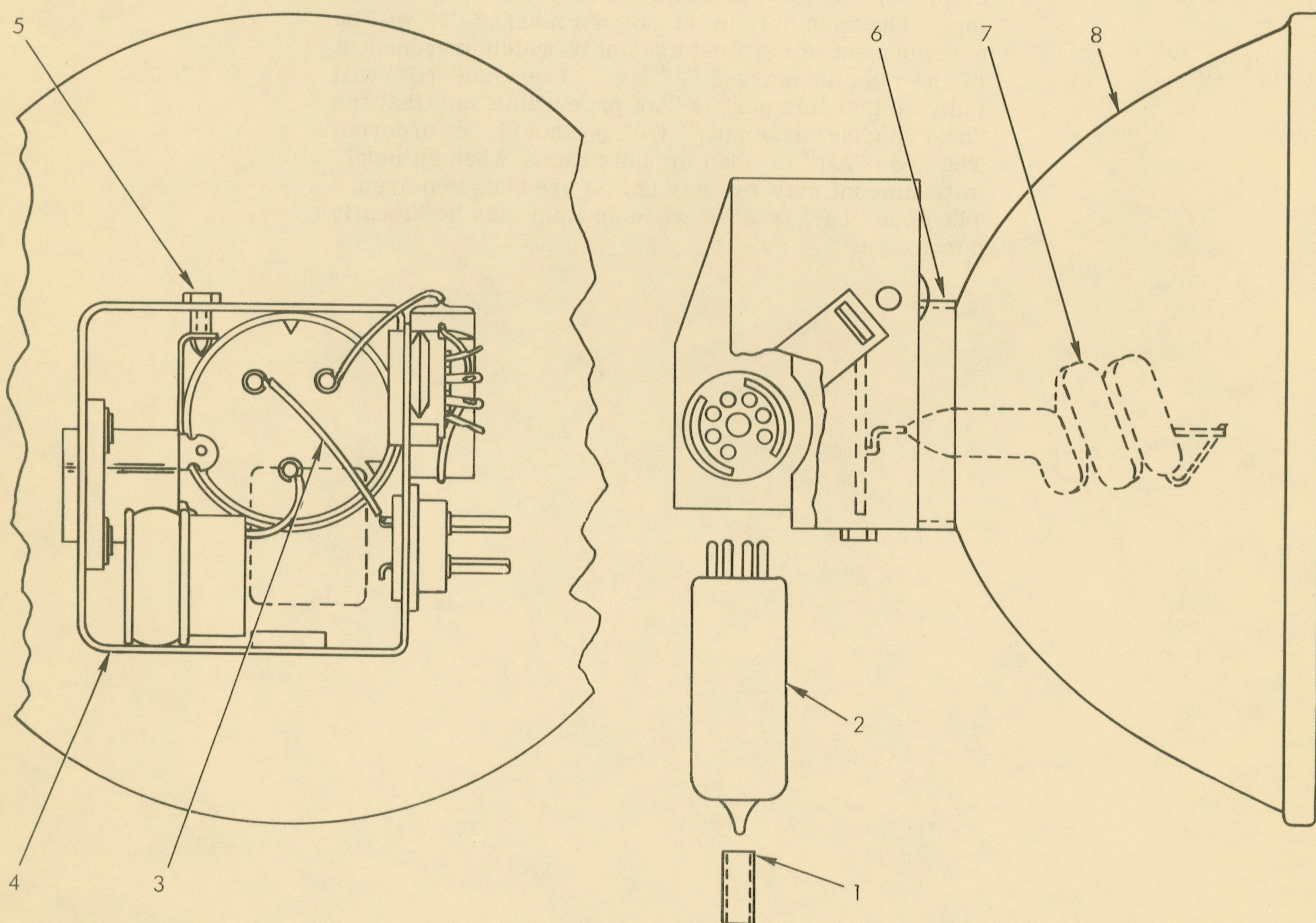


Figure 2. CHASSIS ASSEMBLY

Figure and Index No.	Part Number	12345	Nomenclature	Qty.	Code
1-	35533-G1		LAMP COMPLETE - STROBOFLASH (Cat. No. 2025)	1	
-1	35533-G2		. Housing Assembly - Lamp	1	
	35506-P4		. . Nameplate	1	
	35542-P1		. . Housing - Lamp	NP	NHA
-2	35583		. Shield - Dust	1	
-3	35534-G1		. Chassis Assembly (Figure 2)	1	
2-	35534-G1		CHASSIS ASSEMBLY	Ref	
-1	35534-P5		. Spacer - Trigger Tube, 0.215 in. OD x 0.080 in. ID x 33/64 in. lg, vinyl	1	LP
-2	35534-P4		. Tube - Trigger (RCA No. 5823)	1	
-3	35535-P13		. Tubing - Insulation, No. 18 NEMA Spec. B-A-1 (1-1/4 in. lg)	1	LP
-4	35535-G1		. Bracket Complete (Figure 3)	1	
	Attaching Part				
-5	33921-P19A		. Screw - Self Tapping, 0.625 in. lg, No. 6, hex head, slotted, Parker-Kalon Type A, stl, cad. pl	1	
	----**----				
-6	35664		. Spacer - Bracket	1	
-7	35544-P1		. Tube - Flash, Kemlite U5W, 5W, or DW2	1	
-8	35538-G1		. Reflector Assembly	1	

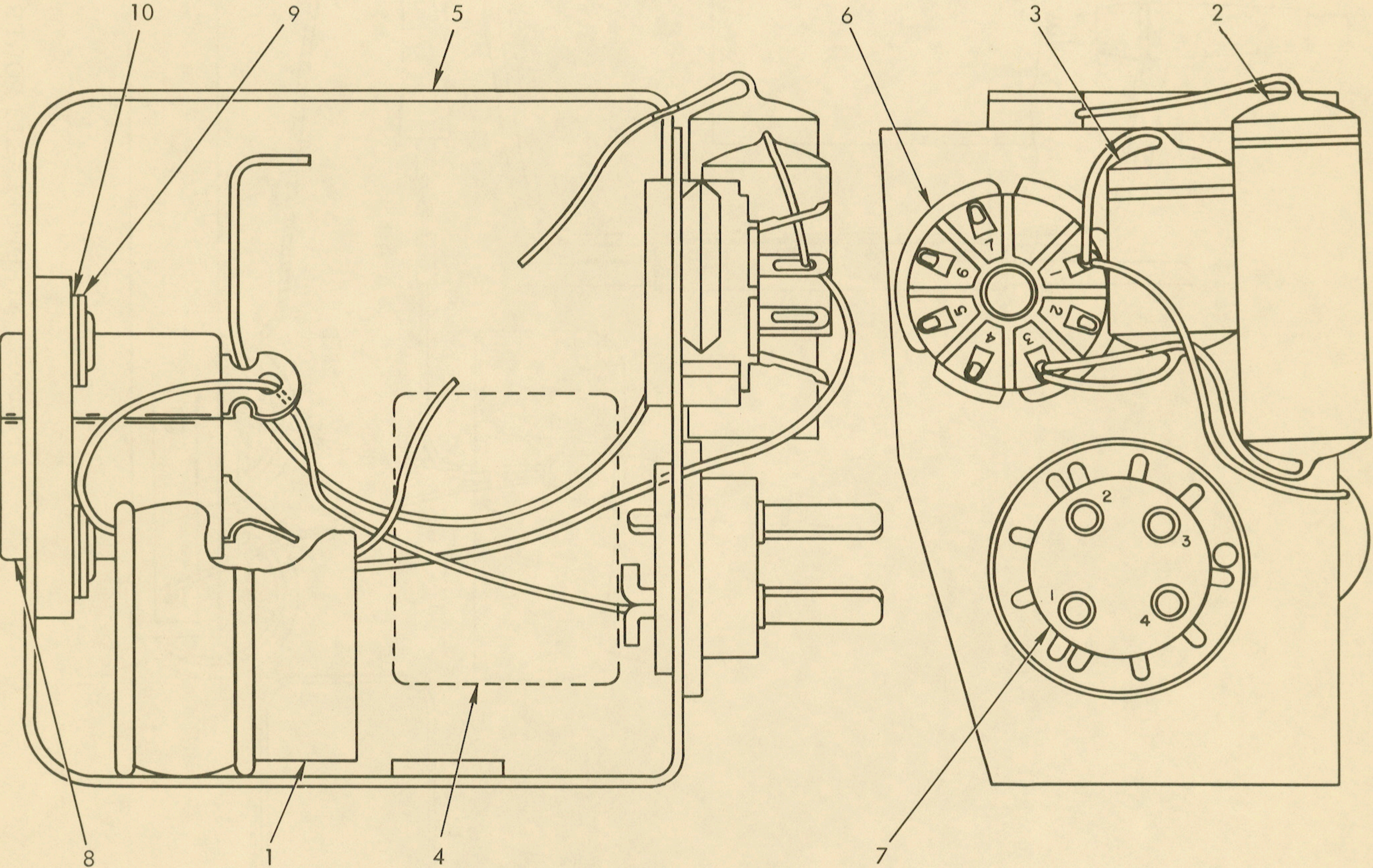


Figure 3. BRACKET COMPLETE

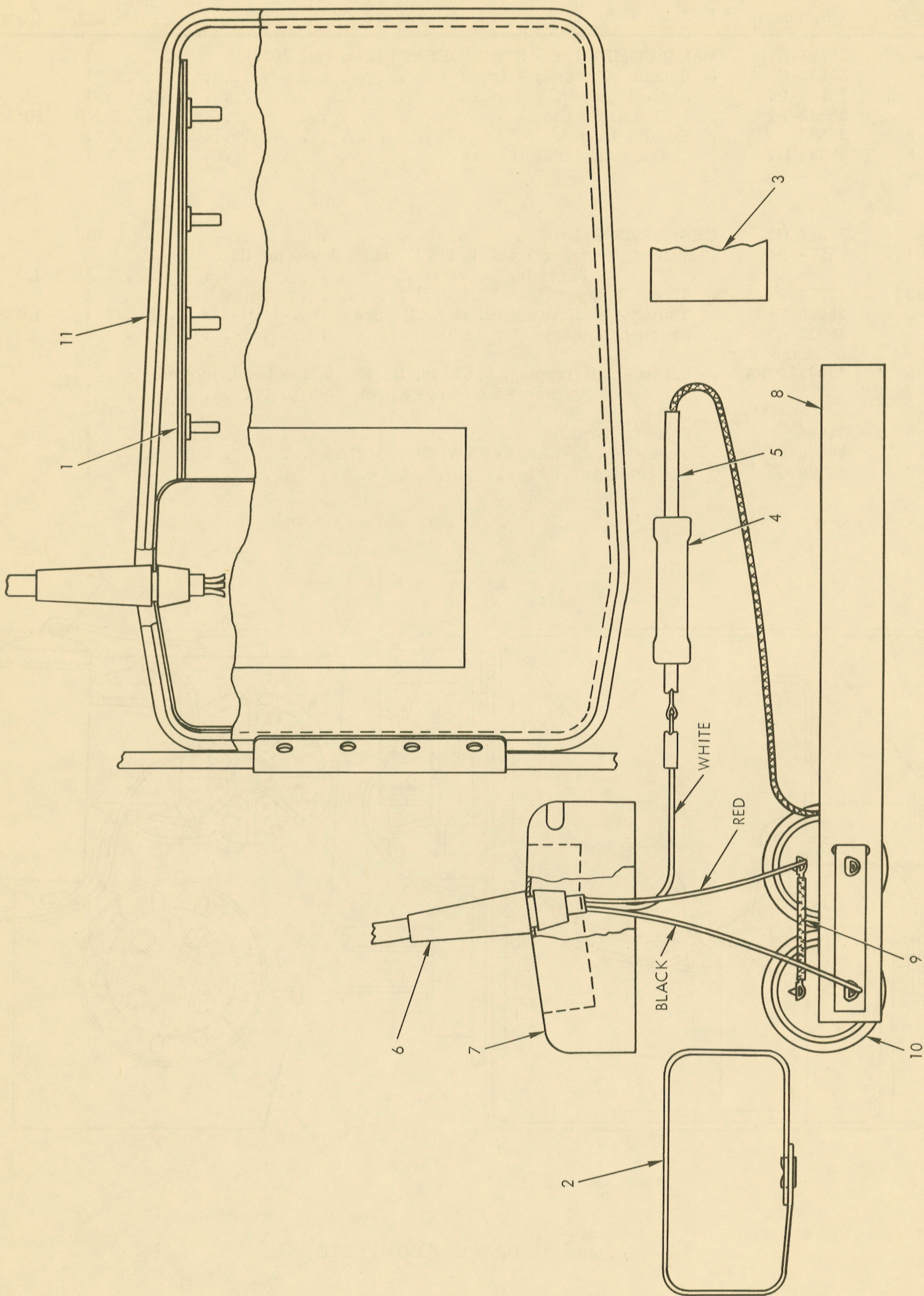


Figure 4. STROBOFLASH I POWER PACK COMPLETE

Figure and Index No.	Part Number	1	2	3	4	5	Nomenclature	Qty.	Code
3-	35535-G1						BRACKET COMPLETE	Ref	
-1	35693-P1						Transformer - Pulse, Electran Mfg. Co. No. 3609B	1	
	Attaching Parts								
	200B4H						Nut - Machine, No. 4-40, hex, brass	1	
	221-4						Washer - Lock, internal tooth, Shakeproof Cat. No. 1204	1	
	35535-P9						Retainer - Metal "D"	1	
	100B4-6						Screw - Machine, 0.375 in. lg, No. 4-40, flat head, slotted, brass	1	
	35535-P8						Clamp (13/16 in. dia)	1	
	----***----								
-2	35535-P11						Capacitor - Fixed, 0.5 mfd, 200V	1	
-3	35535-P12						Capacitor - Fixed, 0.25 mfd, 200V	1	
	402-18-6-2						Resistor, 18 meg. $\pm 10\%$, 1/2 w (used on early models)	1	
	35535-P13						Tubing - Insulation (same as index 3, figure 2) used on leads Nos. 1, 2, and 5 of resistor, index 4	3	LP
-4	35659						Resistor - Printed Circuit	1	
	35535-P16						Wire - Socket Contact (soldered into pins 1 and 4 of plug, index 7) No. 18 AWG, solid copper (approx 1-1/8 in. lg)	2	LP
	35586						Wire - Tube Contact (soldered into pins 2 and 3 of plug, index 7)	1	
-5	35535-G2						Bracket Assembly - Second	1	
-6	35535-P6						Socket - Trigger Tube, 7 pin miniature, American Phenolic Corp. Cat. No. 59-307	1	
-7	35535-P3						Plug, 4 prong miniature, chassis type, American Phenolic Corp. Cat. No. 71-4S	1	
	Attaching Parts								
	120-00-3						Screw - Drive, 0.187 in. lg, No. 00, rd hd, Parker-Kalon Type U (was P/N 33921-P14)	1	
	35535-P4						Ring - Retaining, American Phenolic Corp. Cat. No. 2-009-02	1	
	----***----								
-8	38942-P1						Socket - Trip, 110-250V, 2-prong, Cinch Mfg. Co. Cat. No. 54A-12844 (was P/N 35535-P23)	1	
	Attaching Parts								
	175-6-16						Rivet - Tubular (was P/N 33560-P23)	2	
-9	35472-10						Washer - Flat	2	
-10	30473-7						Washer - Flat	2	
	----***----								
	35536-G1						Bracket Assembly - First	NP	NHA
4-	35500-G1						POWER PACK COMPLETE - STROBOFLASH I (less batteries)	1	
-1	35511-G1						Capacitor Assembly	1	
-2	35513-P1						Housing - Capacitor	1	
-3	35512						Sleeve - Capacitor	1	
-4	35511-P5						Resistor, 500 ohms, 10w $\pm 10\%$, Dale Products No. CS-10	1	
-5	35511-P9						Tubing - Insulation, 0.106 in. ID, varnished, Birnbach Radio Co. No. 307 VC (1-1/4 in. lg)	2	LP
-6	35514-G3						Cord Assembly - Connecting (replacement for P/N 35514-G1 and P/N 35514-G2)	1	
	35558-P5						Cushion - Capacitor (cemented in cap index 7)	1	
-7	35508-P1						Cap - Capacitor	1	
-8	35515-G1						Strap Assembly - Contact	1	
-9	35511-P6						Wire - Jumper, No. 20 AWG, stranded copper, plastic insulation, Alpha Wire Corp. No. 1553 (3/8 in. lg)	1	LP
-10	35511-P4						Capacitor, 250 mfd, 450V, electrolytic, Sprague Electric Co. No. D19054	2	
-11	35501-G1						Housing Complete (Figure 5)	1	
	35500-P3						Battery (240V) Cat. No. 2097	2	

Figure and Index No.	Part Number	1 2 3 4 5	Nomenclature	Qty.	Code
5-	35501-G1		HOUSING COMPLETE (Stroboflash I)	Ref	
-1	35545	.	Slide - Strap	2	
-2	35881-P1	.	Pad - Shoulder	1	
-3	35829-P1	.	Strap - Shoulder (production only) was 35501-P7	Ref	
	35829-P2	.	Strap - Shoulder (replacement only)	1	
-4	35505	.	Cushion - Battery	1	
-5	35508-P2	.	Cap - Capacitor	1	
	35797-P1	.	Nameplate.	1	
	176-4-13H	.	Rivet - Tubular (latch)	NP	NHA
-6	35666-P1	.	Latch.	NP	NHA
	30363-P39H	.	Rivet - Tubular (hinge)	NP	NHA
	35473-2K	.	Washer - Flat (hinge)	NP	NHA
-7	35509-P1	.	Hinge.	NP	NHA
-8	35889	.	Plate	NP	NHA
-9	35510-P1	.	Seal - Housing.	NP	NHA
-10	35503-P2	.	Housing - Front	NP	NHA
-11	35503-P1	.	Housing - Rear	NP	NHA
6-	35521-G1		POWER PACK COMPLETE - STROBOFLASH II (less batteries) . .	1	
-1	35525-G1	.	Housing Assembly - Upper (Figure 7)	1	
	Attaching Parts				
-2	112-416-6A	.	Screw - Machine, 0.375 in. lg, No. 1/4-20, truss head, slotted, stl, cad. pl	2	
-3	35532	.	Button See page 28 for earlier models	2	
	-----***----				
-4	35522-G1	.	Housing Complete - Lower	1	
	35558-P2	.	Cushion - Battery	2	
	37301	.	Slide - Strap, Atlas Metal Products Cat. No. 3602 (was P/N 35522-P4)	2	
	38327	.	Rivet (strap) was P/N 35522-P3	NP	NHA
	35524-P1	.	Strap - Shoulder	NP	NHA
	35523-P1	.	Housing - Lower	NP	NHA
	35521-P5	.	Battery (225V) Cat. No. 2092	2	
7-	35525-G1		HOUSING ASSEMBLY - UPPER (Stroboflash II)	Ref	
-1	254-3	.	Ring - Retaining, Waldes Kohinoor Inc. P/N 5105-31 (was P/N 30241-P19)	2	
-2	35798	.	Clamp, Weckesser Co. Cat. No. 1/4-5	1	
	Attaching Parts				
-3	121-6R8H	.	Screw - Self Tapping, 0.500 in. lg, No. 6, binding (pan) head, slotted, Parker-Kalon Type Z, steel, nickel plate	1	
-4	202-4-3	.	Nut - Speed, Tinnerman Products Inc. P/N C70000-6A-4	1	
	-----***----				
-5	35514-G3	.	Cord Assembly - Connecting (replacement for P/N 35514-1)2	1	
-6	35526-G1	.	Tray Complete - Capacitor (Figure 8)	1	
-7	35525-G2	.	Housing Subassembly - Upper	1	
	35506-P2	.	Nameplate	1	
	35531-P1	.	Housing	NP	NHA
8-	35526-G1		TRAY COMPLETE - CAPACITOR (Stroboflash II)	Ref	
-1	410-3	.	Fuse, 0.20 amp, 250V, Bussman Mfg. Co. No. MDL 2/10	1	
-2	35530	.	Jumper - Capacitor	2	
	Attaching Parts				
-3	31270-P3	.	Fastener - Sems.	4	
	-----***----				

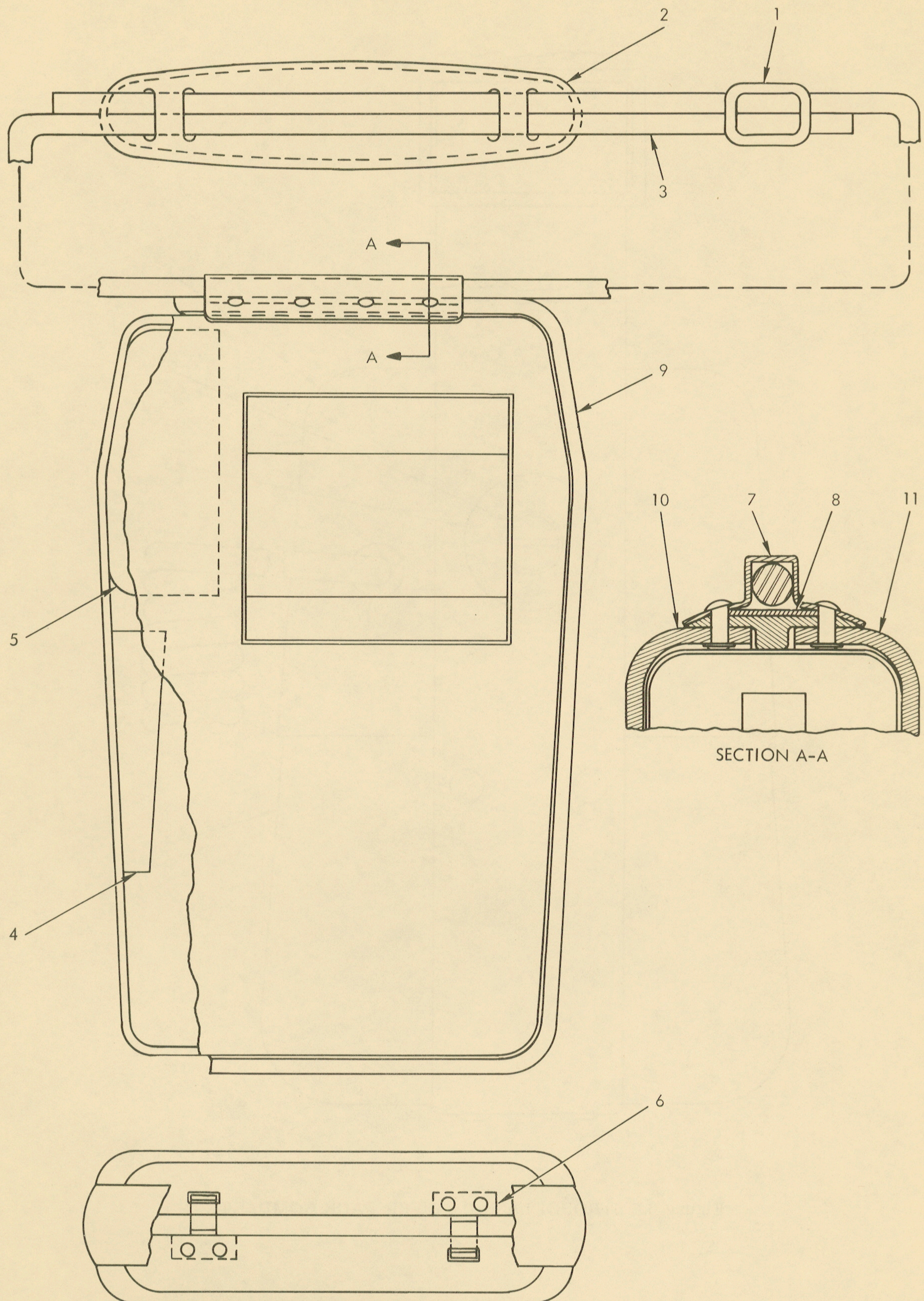


Figure 5. HOUSING COMPLETE (Strobeflash I)

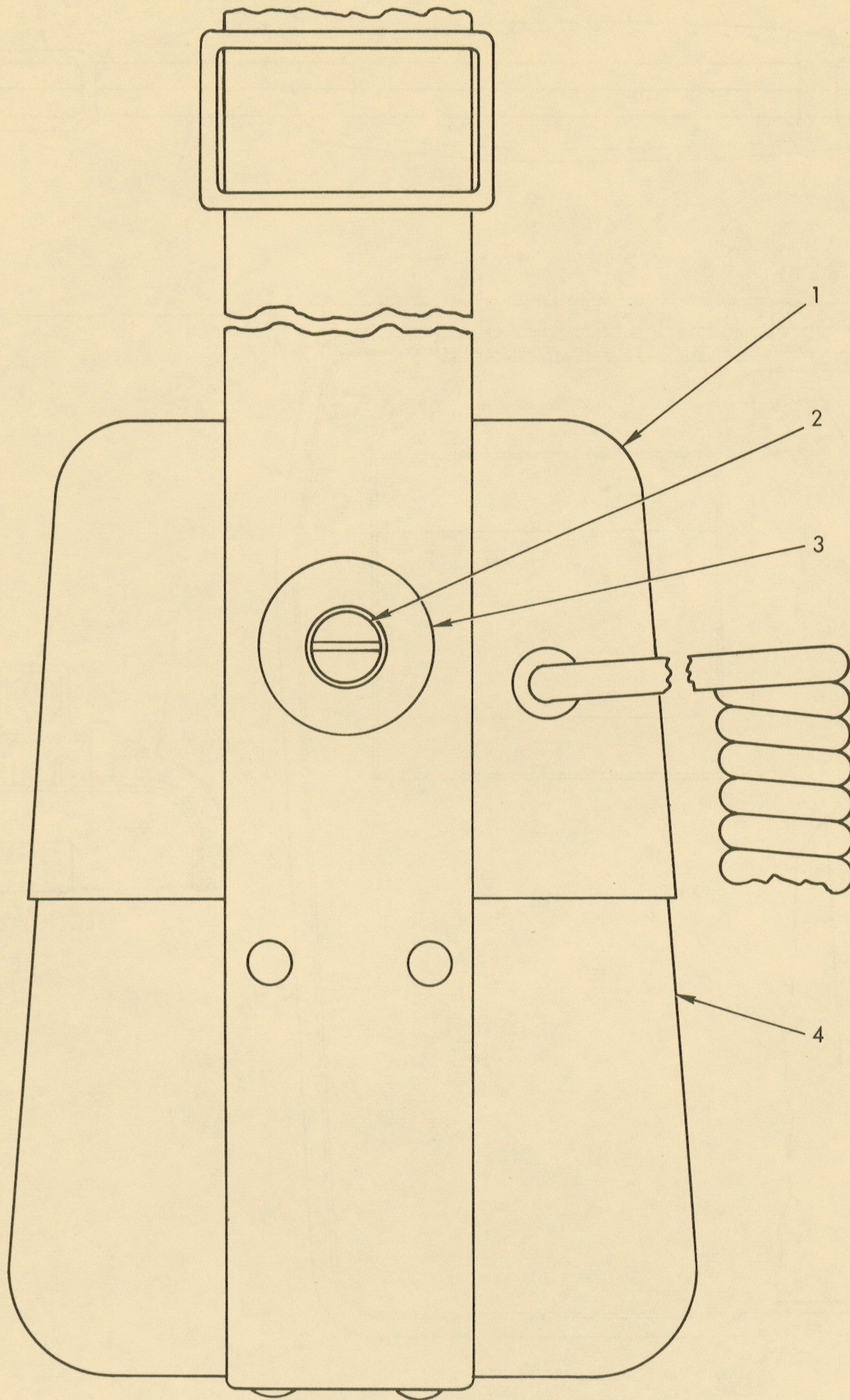


Figure 6. STROBOFLASH II POWER PACK COMPLETE

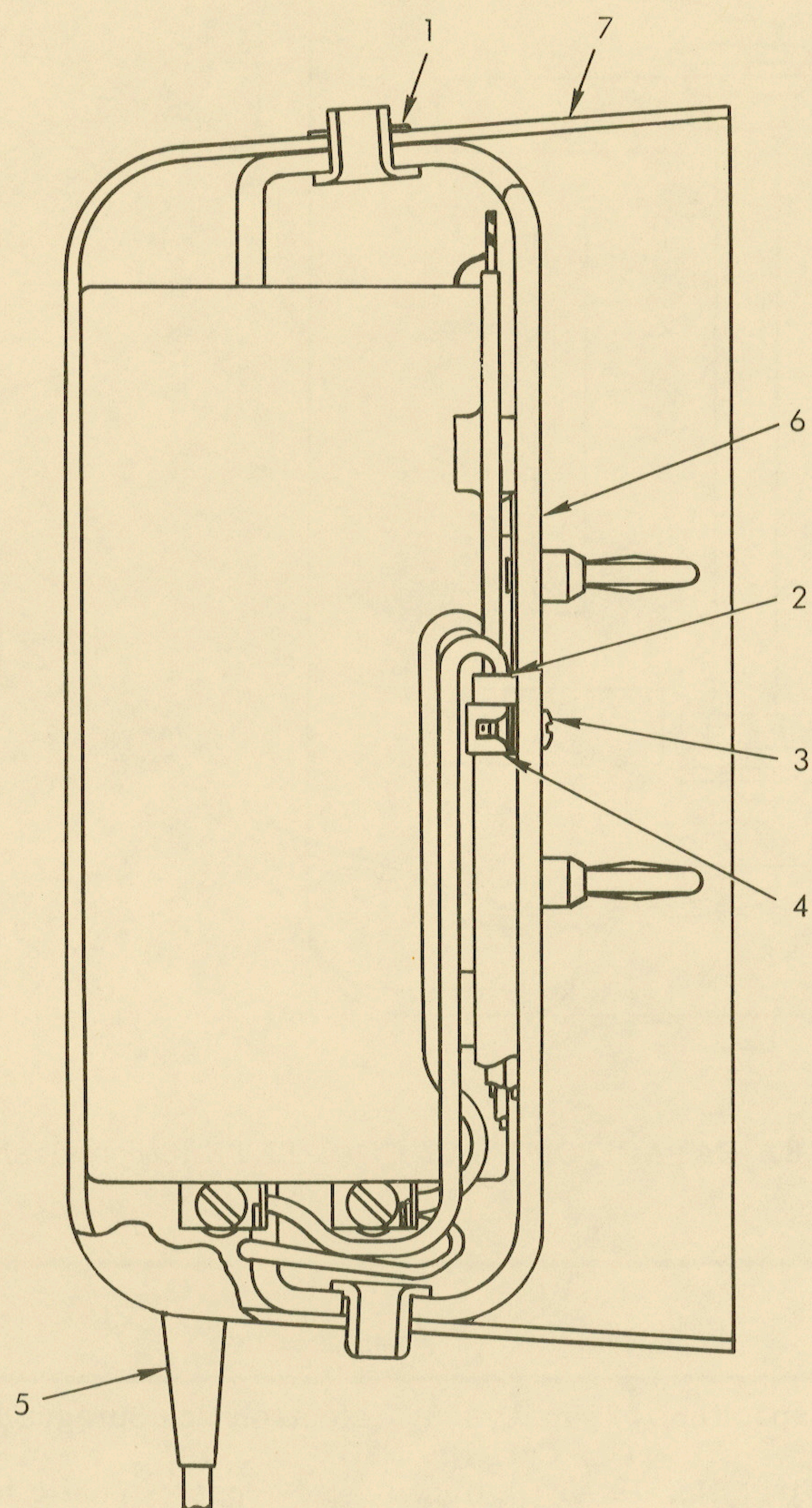


Figure 7. UPPER HOUSING ASSEMBLY (Stroboflash II)

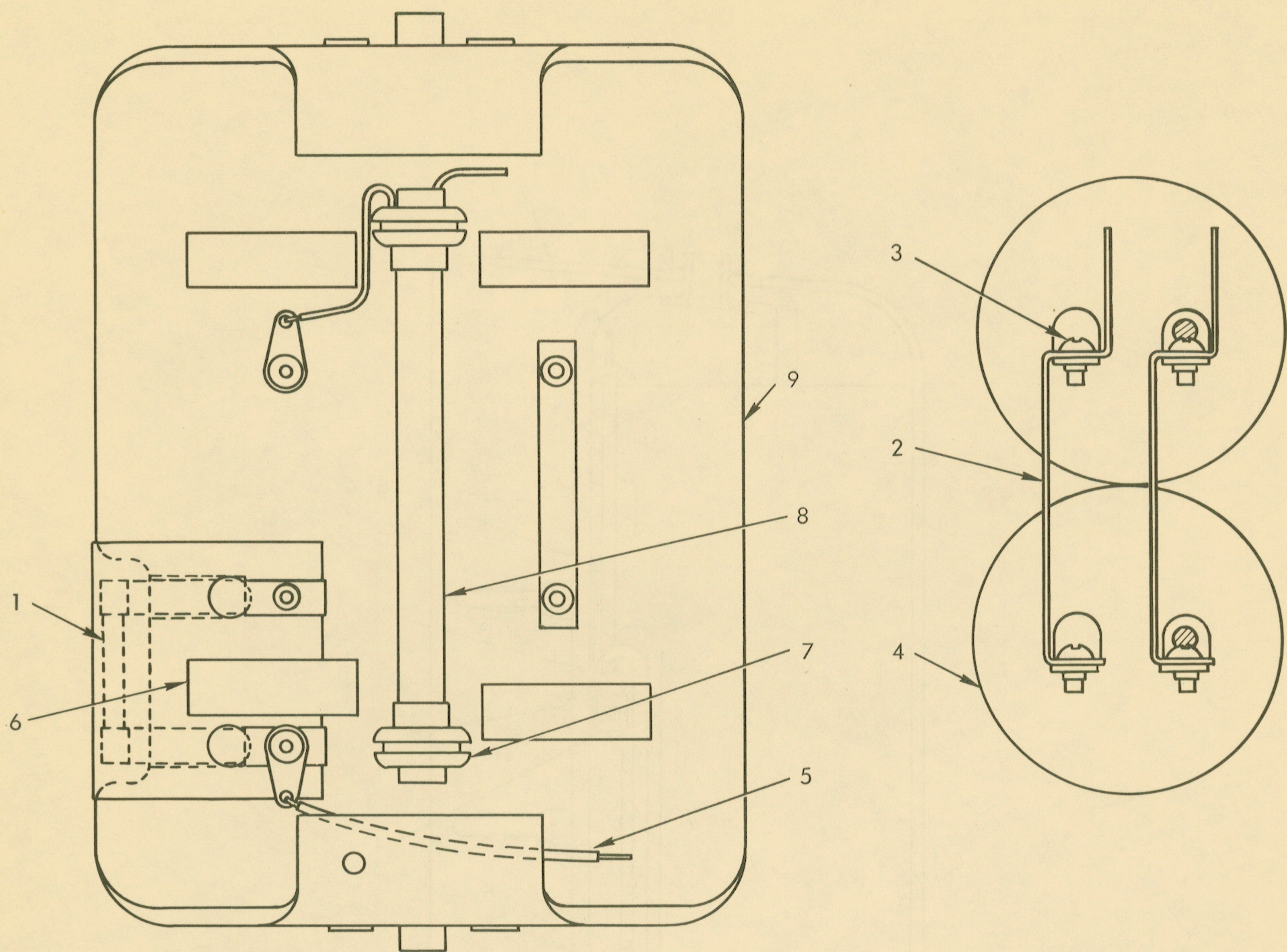


Figure 8. CAPACITOR TRAY COMPLETE (Stroboflash II)

Figure and Index No.	Part Number	1	2	3	4	5	Nomenclature	Qty.	Code
8-4	35526-P2	.					Capacitor, 525 mfd, 450V, electrolytic, Sprague Electric Co. Cat. No. 22D2	2	
-5	35526-P10	.					Wire, No. 18 AWG, tinned solid copper, plastic insulation (4-3/8 in. lg)	1	LP
-6	35558-P3	.					Cushion - Capacitor	4	
-7	265-3	.					Grommet - Rubber, General Cement Mfg. Co. Cat. No. 1043 (was P/N 35553-P3)	2	
-8	35796-P1	.					Resistor, 500 ohms $\pm 10\%$, 40w, Lectrohm Inc. Cat. No. C40-500A (was P/N 35526-P13)	1	
-9	35527-G1	.					Tray Assembly (riveted assembly)	1	

NOTE: The Stroboflash Power Pack III is no longer available. However, the following parts list may be used as a guide for ordering replacement parts.

Ref	POWER PACK COMPLETE - STROBOFLASH III.	Ref
Ref	. Housing Complete - Upper (no longer available)	Ref

Figure and Index No.	Part Number	1	2	3	4	5	Nomenclature	Qty.	Code
	254-3	.	.	.	.	.	Ring - Retaining (same as index 1, figure 10)	2	
	410-2	.	.	.	.	.	Fuse (same as index 5, figure 10)	1	
	35798	.	.	.	.	.	Clamp (same as index 6, figure 10)	1	
	121-6R8H	.	.	.	.	.	Screw - Self Tapping (same as index 7, figure 10).	1	
	221-6	.	.	.	.	.	Washer - Lock (same as index 8, figure 10)	1	
	202-4-3	.	.	.	.	.	Nut - Speed (same as index 9, figure 10).	1	
	35514-G3	.	.	.	.	.	Cord Assembly - Connecting (replacement for P/N 35514-G4 and P/N 35514-G2)	1	
	37236-P2	.	.	.	.	.	Wire (same as index 11, figure 10)	1	
	35549-G1	.	.	.	.	.	Tray Assembly - Capacitor (same as index 12, figure 10)	1	
	Ref	.	.	.	.	.	Pack Assembly - Capacitor (no longer available)	Ref	
	35556-P1	.	.	.	.	.	Sleeve - Capacitor (same as index 1, figure 11)	1	
	Ref	.	.	.	.	.	Wire (outside capacitor wiring) use P/N 35553-P5 and cut to approximately 10 in. lg (refer to index 6A, figure 11).	1	
	35555-P1	.	.	.	.	.	Insulator - Outer (same as index 6, figure 11)	1	
	35553-P5	.	.	.	.	.	Wire (inner capacitor wiring) same as index 6A, figure 11.	1	
	35554-P1	.	.	.	.	.	Insulator - Inner (same as index 7, figure 11)	1	
	265-3	.	.	.	.	.	Grommet - Rubber (same as index 9, figure 11)	6	
	35796-P2	.	.	.	.	.	Resistor (same as index 10, figure 11)	3	
	35511-P4	.	.	.	.	.	Capacitor (same as index 12, figure 11).	8	
	35557-P1	.	.	.	.	.	Housing - Upper (no longer available)	Ref	
	Attaching Parts								
	112-416-6A	.	.	.	.	.	Screw - Machine (same as index 2, figure 6)	2	
	35532	.	.	.	.	.	Button (same as index 3, figure 6) See page 28 for earlier models	2	
	----***----								
	35522-G1	.	.	.	.	.	Housing Complete - Lower (same as index 4, figure 6).	1	
	35521-P5	.	.	.	.	.	Battery (225V) Cat. No. 2092	2	
9-	35521-G3	.	.	.	.	.	POWER PACK COMPLETE - STROBOFLASH IV (less batteries).	1	
-1	35548-G1	.	.	.	.	.	Housing Assembly - Upper (Figure 10)	1	
	Attaching Parts								
-2	112-416-6A	.	.	.	.	.	Screw - Machine (same as index 2, figure 6)	2	
-3	35532	.	.	.	.	.	Button (same as index 3, figure 6) See page 28 for earlier models	2	
	----***----								
-4	35522-G1	.	.	.	.	.	Housing Complete - Lower (same as index 4, figure 6).	1	
	35521-P5	.	.	.	.	.	Battery (225V) (Cat. No. 2092).	2	
10-	35548-G1	.	.	.	.	.	HOUSING ASSEMBLY - UPPER (Stroboflash IV)	Ref	
-1	254-3	.	.	.	.	.	Ring - Retaining, Waldes Kohinoor Inc. P/N 5105-31 (was P/N 30241-P19)	2	
-2	37300	.	.	.	.	.	Knob (includes setscrew) was P/N 35548-P6	1	
-2A	170-8-7	.	.	.	.	.	Screw - Set, 0.4375 in. lg, No. 8-32, slotted, headless, cup point, steel	1	
-3	35665-P3	.	.	.	.	.	Nut - Machine (see index 2, figure 11, when ordering for replacement)	Ref	
-4	35665-P4	.	.	.	.	.	Washer - Lock (see index 2, figure 11, when ordering for replacement)	Ref	
-5	410-2	.	.	.	.	.	Fuse, 0.25 amp, 250V, Bussman Mfg. Co. No. MDL 1/4	1	
-6	35798	.	.	.	.	.	Clamp, Weckesser Co. Cat. No. 1/4-5	1	
	Attaching Parts								
-7	121-6R8H	.	.	.	.	.	Screw - Self Tapping, 0.500 in. lg, No. 6, binding (pan) head, slotted, steel, Parker-Kalon Type Z, nickel plate	1	
-8	221-6	.	.	.	.	.	Washer - Lock, internal tooth, Shakeproof Cat. No. 1206.	1	
-9	202-4-3	.	.	.	.	.	Nut - Speed, flat type, Tinnerman Products, Inc. P/N C70000-6A-4	1	
	----***----								

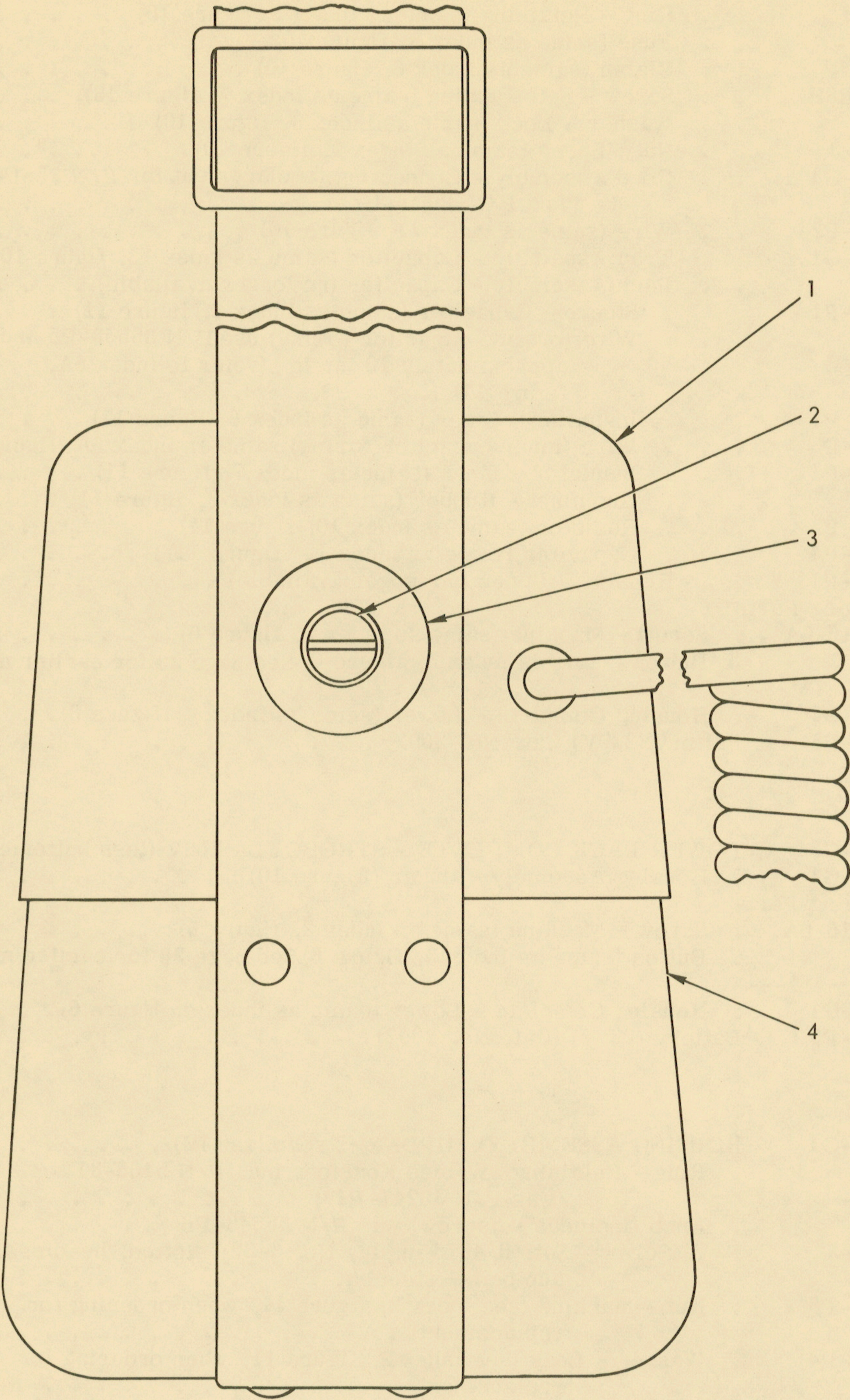


Figure 9. STROBOFLASH IV POWER PACK COMPLETE

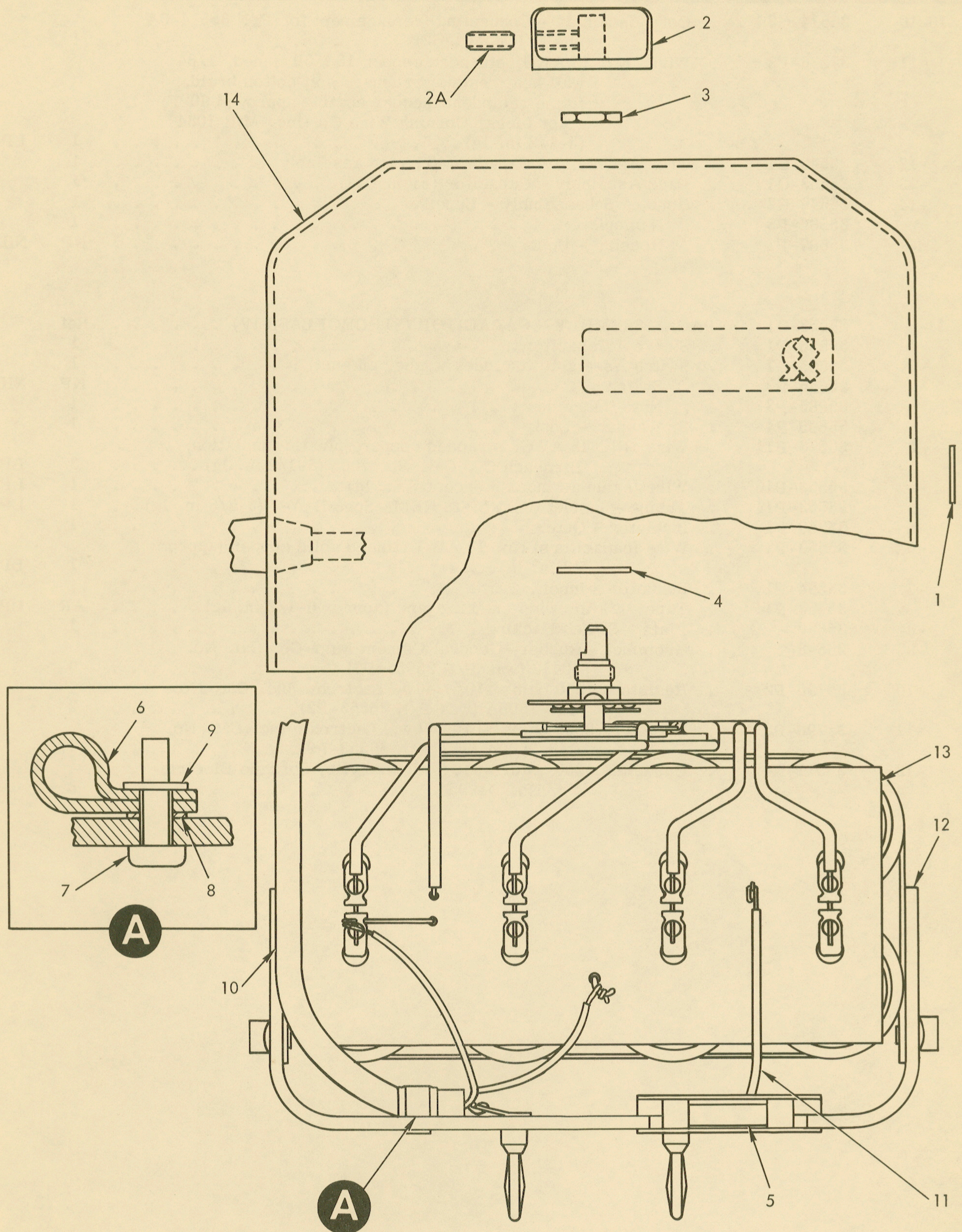


Figure 10. UPPER HOUSING ASSEMBLY (Stroboflash IV)

Figure and Index No.	Part Number	1 2 3 4 5	Nomenclature	Qty.	Code
10-10	35514-G3	.	Cord Assembly - Connecting (replacement for P/N 35514-G4 and P/N 35514-G2)	1	
-11	37236-P2	.	Wire, No. 18 AWG, stranded copper 16 x 30 tinned, 1/64 wall heat resistant rubber, soft cotton braid, flame retardent lacquer coating approved 90°F, color black, Cornish Wire Co. Inc. Mill 1084 (3-1/2 in. lg)	1	LP
-12	35549-G1	.	Tray Assembly - Capacitor (riveted assembly)	1	
-13	35553-G1	.	Pack Assembly - Capacitor (Figure 11)	1	
-14	35548-G2	.	Housing Subassembly - Upper	1	
	35506-P5	.	Nameplate	1	
	35667-P1	.	Housing - Upper	NP	NHA
11-	35553-G1		PACK ASSEMBLY - CAPACITOR (STROBOFLASH IV)	Ref	
-1	35556-P1	.	Sleeve - Capacitor	1	
-2	35665-G1	.	Switch Assembly (includes washer and nut)	1	
	35665-P2	.	Switch	NP	NHA
	35665-P3	.	Nut - Machine	1	
	35665-P4	.	Washer - Lock	1	
-3	35553-P11	.	Wire, No. 18 AWG, stranded copper, plastic insulation, Birnbach Co. Cat. No. 7005 (5-1/2 in. lg)	3	LP
-4	35553-P10	.	Wire (same as index 3 except 7 in. lg)	1	LP
-5	35553-P13	.	Tubing - Insulation, No. 16 NEMA Spec B-A-1 (5-5/8 in. lg)	1	LP
-6	35555-P1	.	Insulator - Outer	1	
-6A	35553-P5	.	Wire (capacitors) No. 18 AWG, tinned solid copper (approx 12 in. lg)	1	LP
-7	35554-P1	.	Insulator - Inner	1	
	35553-P14	.	Tape, 1/2 in. wide masking tape (approx 6-1/2 in. lg)	AR	LP
-8	35680	.	Plate - Switch Backing	1	
-9	265-3	.	Grommet - Rubber, General Cement Mfg. Co. Cat. No. 10432 (was P/N 35553-P3)	6	
-10	35796-P2	.	Resistor, 1500 ohms $\pm 10\%$, 40w, Lectrohm Inc. Cat. No. C40-1500A (was P/N 35553-P2)	2	
-11	35796-P3	.	Resistor, 2500 ohms $\pm 10\%$, 40w, Lectrohm Inc. Cat. No. C40-2500A (was P/N 35553-P9)	1	
-12	35511-P4	.	Capacitor, 250 mfd, 450V, electrolytic, Sprague Electric Co. No. D19054	8	

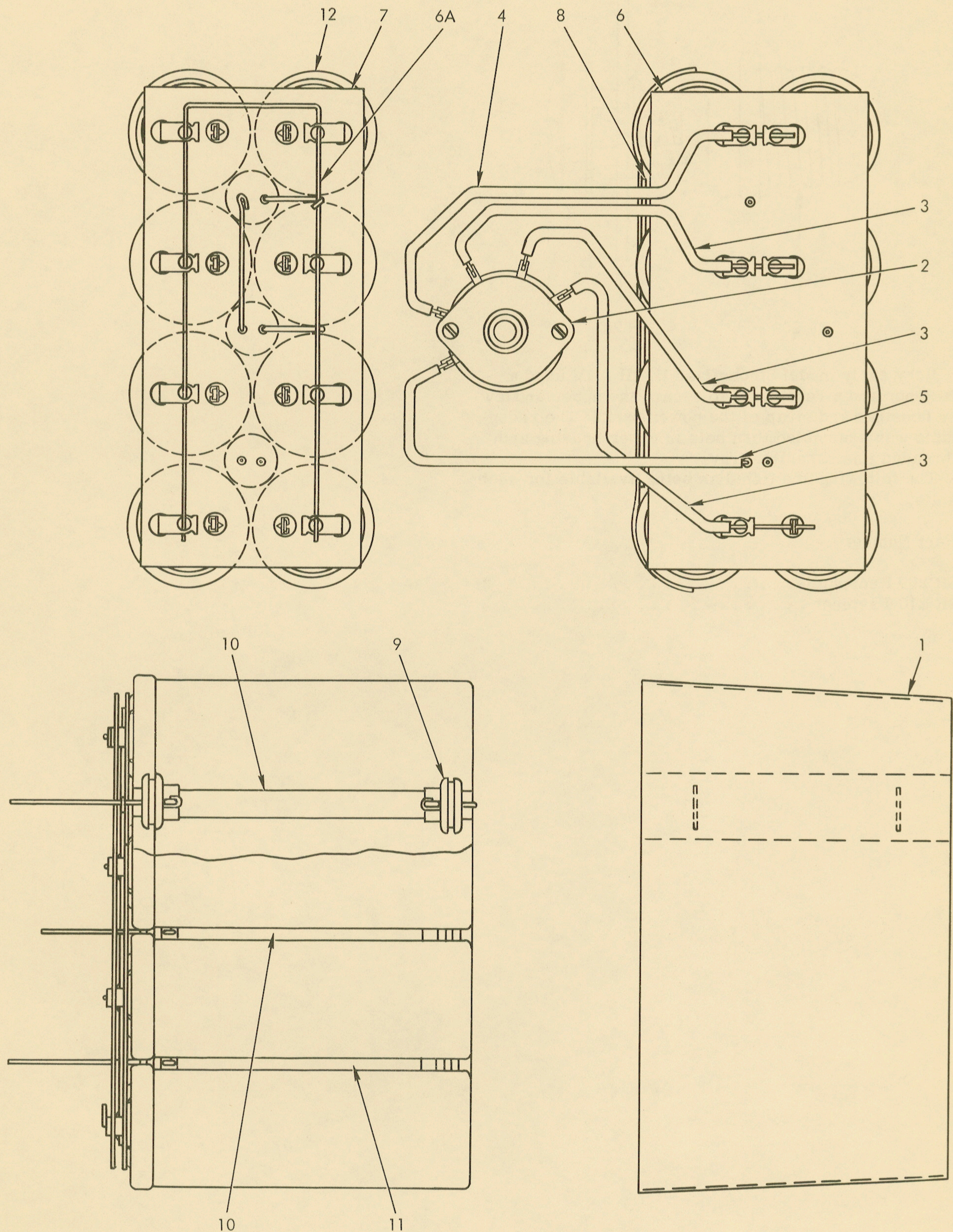
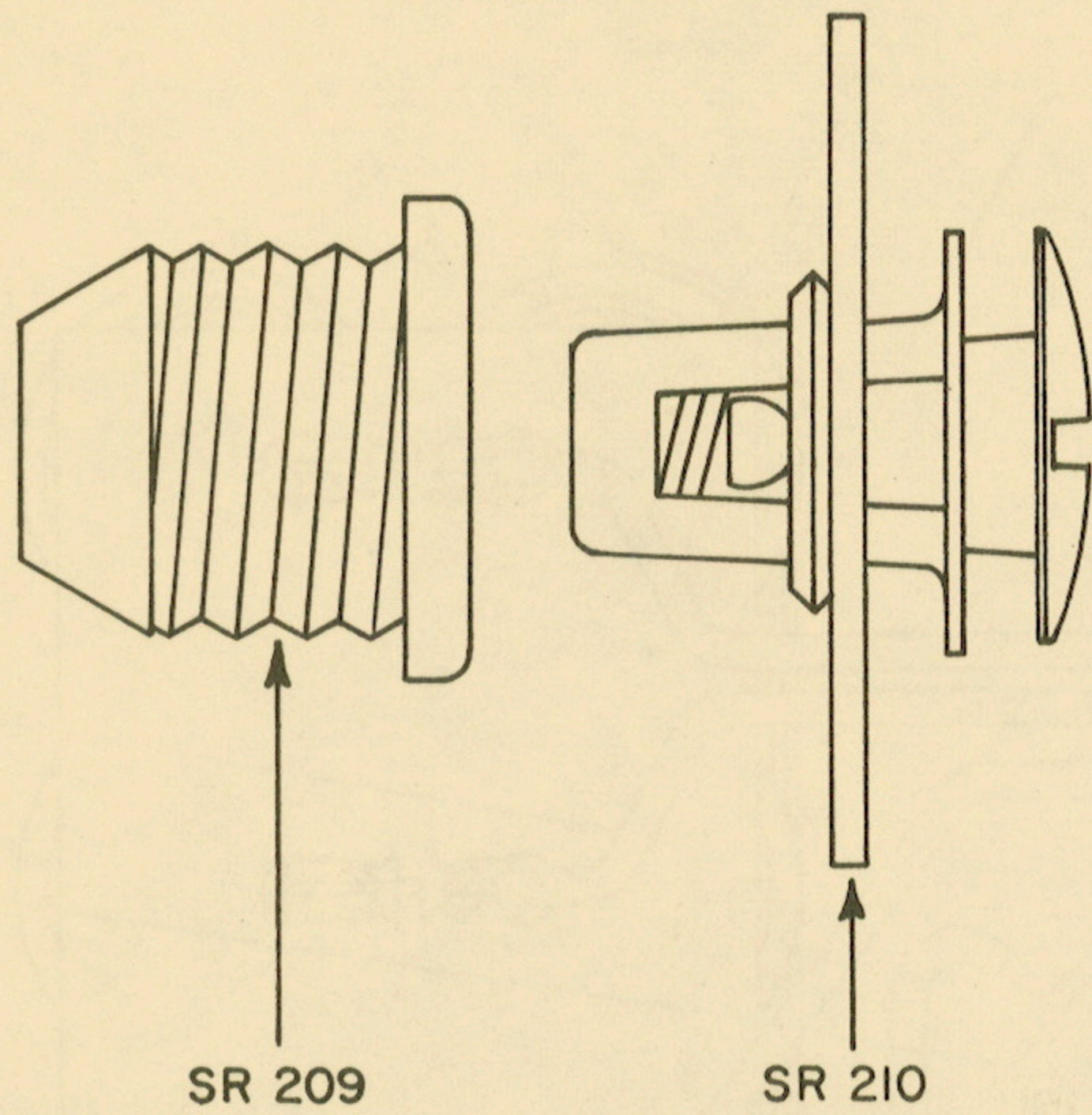


Figure 11. CAPACITOR PACK ASSEMBLY (Strobflash IV)

NOTES



Very early model Strobflash II, III & IV used a fastener and a receptacle to secure the upper and lower housings and strap of the power pack. The receptacle was assembled thru hole in upper housing and threaded into capacitor tray.

The following are listed as being available for such units.

Part Number

SR 209 Receptacle	2
SR 210 Fastener	2



graflex®

SERVICE BULLETIN

NO: 18

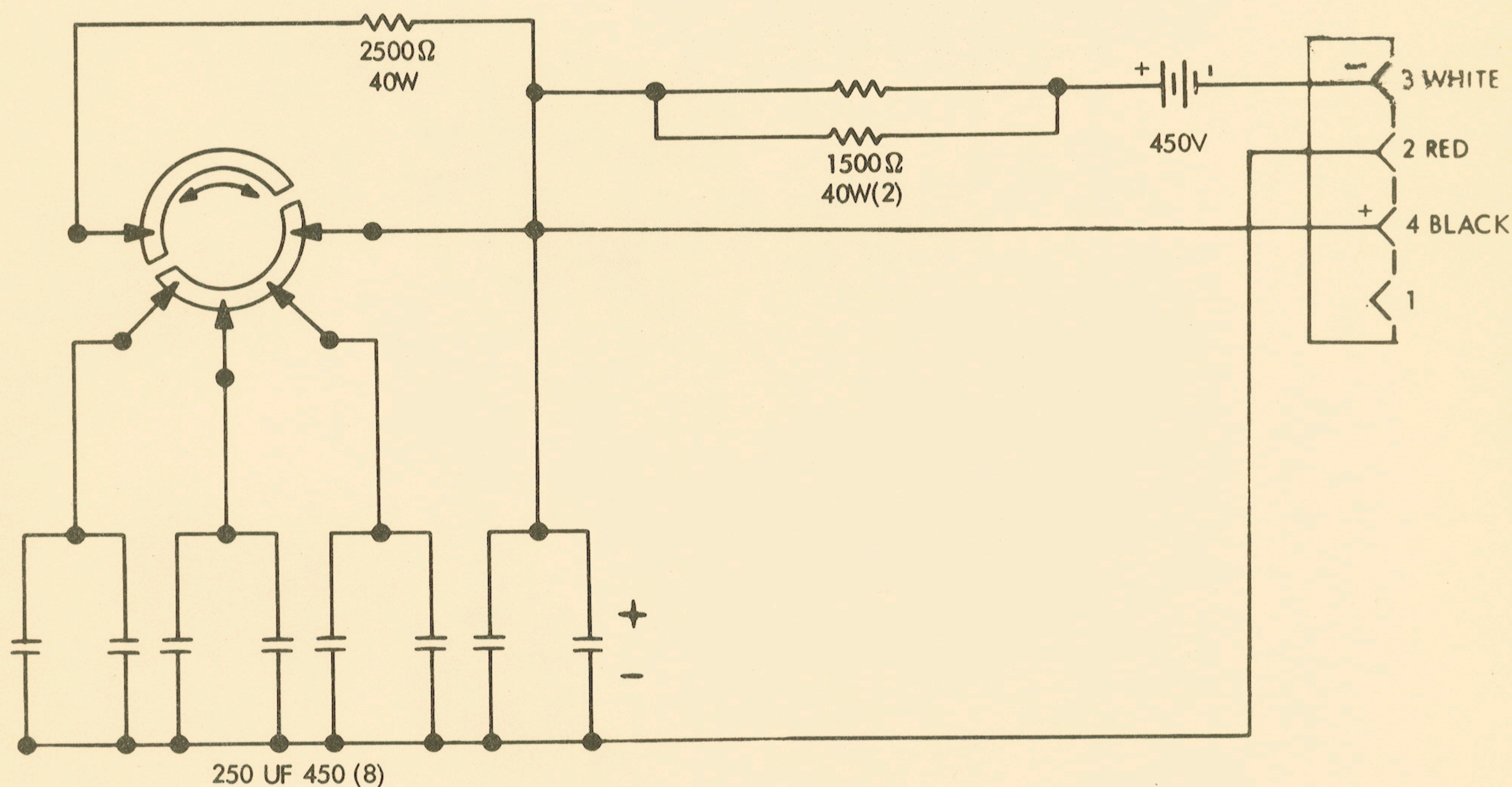
DATE: JANUARY, 1969

REF: STROBOFLASH IV

ALTERNATE POSITIONING OF POWER PACK CAPACITORS

Stroboflash IV Power Pack Assemblies have been manufactured with the eight 250 mfd capacitors installed in two separate configurations. One configuration is illustrated in the schematic diagram in the Service Manual, and the other is illustrated below.

STROBOFLASH IV POWER PACK



SCHEMATIC DIAGRAM



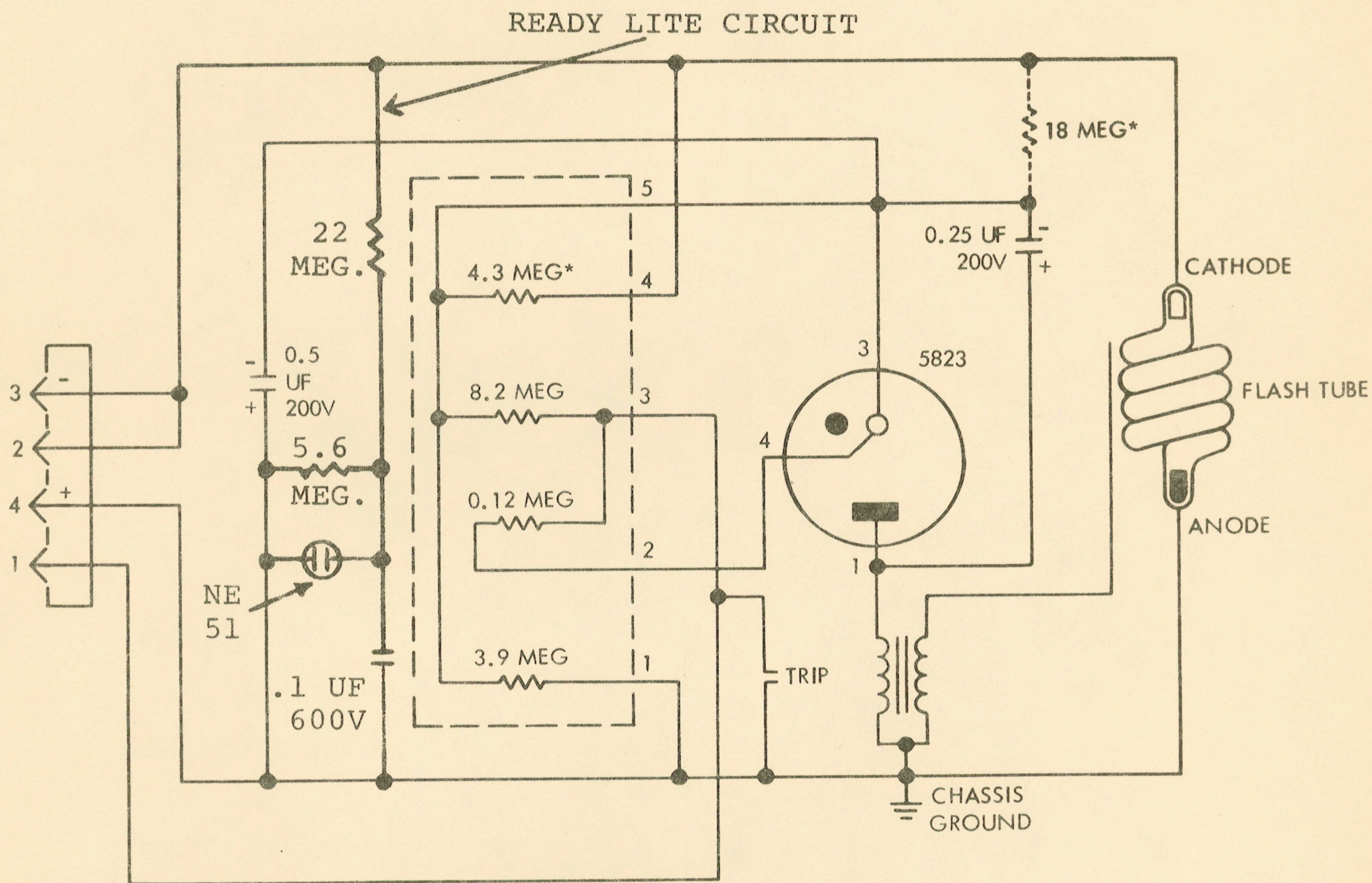
graflex®

SERVICE BULLETIN

NO: 13
DATE: DECEMBER, 1968
REF: STROBOFLASH

STROBOFLASH READY-LITE CIRCUIT

By use of this circuit a ready-lite can be installed in the lamphead of all models of the Strobflash. Parts are not stocked by Graflex and must be procured locally. The correct firing voltage is measured across connections 1 and 4 of the printed circuit. The minimum firing voltage is 350 volts DC. Adjustment should be made to the value of the 5.6 megohm resistor in parallel to the NE51 neon lamp to provide this minimum glow point.



*18 MEG RESISTOR, SHOWN IN PHANTOM, ADDED TO UNITS WITH 5.7 MEG INSTEAD OF 4.3 MEG RESISTOR IN PRINTED CIRCUIT RESISTOR